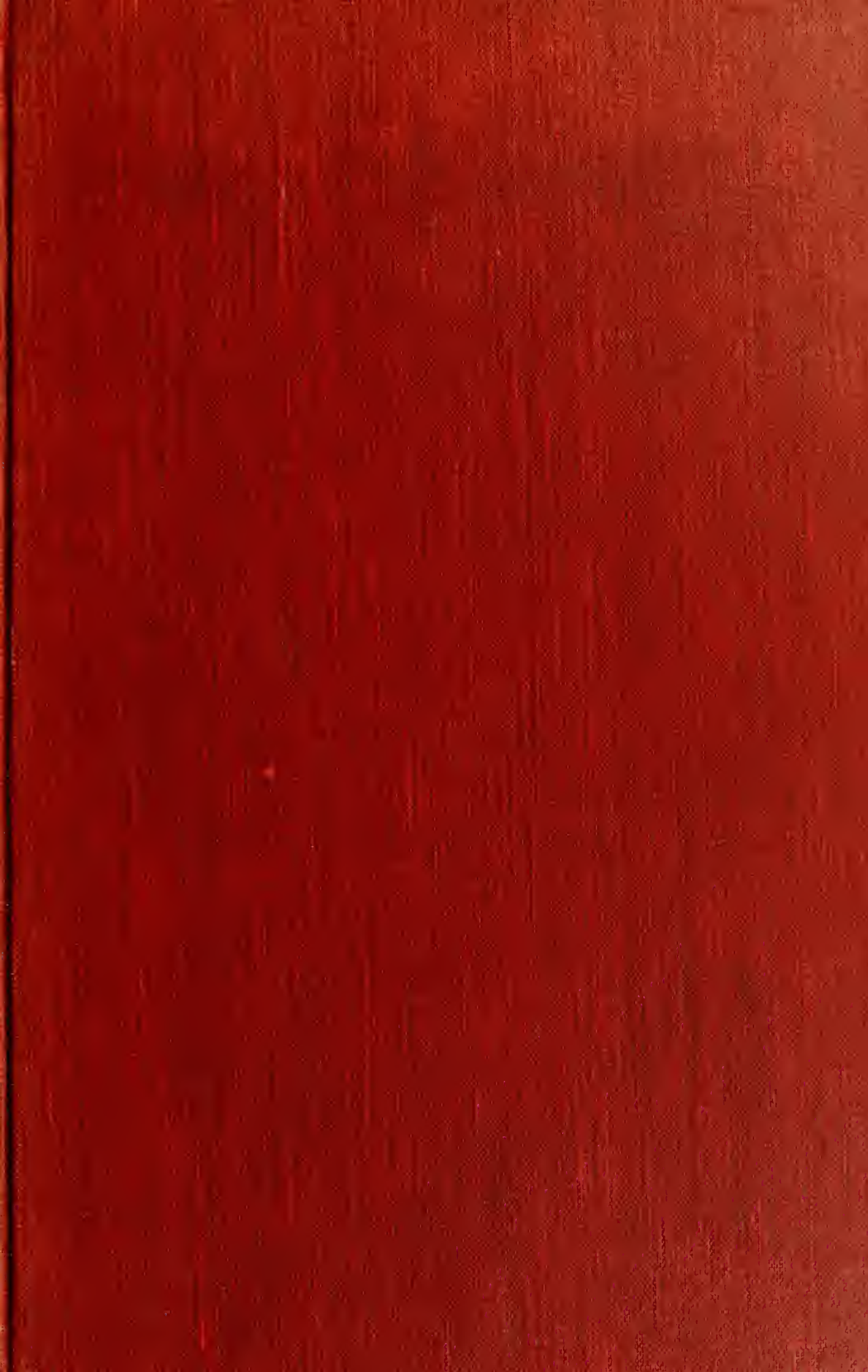




A. L. MELANDER
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R.H. Meade.

Monograph ypt. British spec. of
Sarcophaga.

1876.



MONOGRAPH UPON THE BRITISH SPECIES OF *SARCOPHAGA*, OR
FLESH-FLY.

BY R. H. MEADE.

Genus *SARCOPHAGA*.

GL
531
M48
Ent.

Gen. char. Body elongate. Antennæ incumbent, with the third joint rather more than twice the length of the second. Arista long, with the basal half plumose (except in some aberrant species), and the extremity bare. Eyes naked, and separated from each other in both sexes by a frontal space, which is wider in the females than in the males. Margins of facial groove smooth. Forehead with two rows of setæ in the males, and four in the females. Checks with a few small bristles placed in a somewhat oblique row below each eye, and varying in size in different species. Thorax large, but greater in length than width, divided into two nearly equal parts by a transverse suture, and furnished with a number of bristles, some of which are placed upon the sides in irregular lines, while others are always arranged longitudinally in two parallel rows upon the dorsum. These rows are placed upon the two outer of the three broad black stripes by which the back is marked, and always contain a definite number of bristles in each row, some in front and others behind the transverse suture, the number varying in different species, but always constant in the same. The central part of the back is free from bristles, with the exception of two placed just above the base of the large scutellum.

Abdomen elongated in the males, and oval in the females, consisting of four distinct segments, with the addition in the males of two terminal or anal joints, which are more or less tumid and involuted. The segments are armed with spines upon their posterior margins, but not upon their middle surfaces (as in the *Tachinidæ*). Two spines are always placed near together in the centre of the posterior edge of the third segment, and (in many species) two also upon the same part of the second segment.

Alulets or scales large, the lower scale being about twice as long as the upper.

Wings with the fifth longitudinal vein bent at an acute or right angle, and then extending in a curved line to the margin, which it reaches at a short distance from the extremity of the fourth longitudinal, leaving the first posterior cell partly open. The angle of the fifth vein is apparently furnished at the point of flexure with a short appendix. The fourth longitudinal vein is always armed at its base with a row of short spines or teeth, which are also met with in some species upon the second vein.

Legs furnished with numerous spines and hairs. Feet with large pulvilli and claws; the points of the latter are mostly broken off on the fore, and often on the middle, feet of the males.

The genus *Sarcophaga*, which includes a considerable number of British species (I have already determined twenty, and have no doubt that many more will be found), is composed of a series of yellowish or whitish-grey flies, striped and variegated with brown or bluish-black. The palpi and antennæ are always black; the thorax is marked with three longitudinal broad black stripes upon the dorsum, and also with some short and broken lines upon the sides; the abdomen is tessellated upon its upper surface, with a number of irregularly shaped black and white spots, forming glittering patches, which reflect the light, so that they appear of different sizes, shapes, and colours, when viewed in different directions, but are arranged more or less in longitudinal rows or stripes, which are much more distinct in some species than in others.

The majority of these flies are so much alike, that it is impossible to distinguish the separate species from each other by mere differences in colour and design; and the greater number of authors having chiefly relied upon these points, very few of the species described by them can be determined with certainty. Varieties of the same have been named as separate species, different species have been confounded together, and the same species has been described by different authors under different names. Though so much alike, however, in general appearance, many very good structural points exist by which the different species of *Sarcophaga* may be separated from one another, and named with certainty; and, before commencing the description of them, I will briefly enumerate the principal distinctive characters upon which reliance may be placed.

The *first*, which has been noticed by all authors, and by which the species may be separated into two principal divisions, is the colour of the terminal segment of the abdomen, which is always black or grey in one division, and red in the other.

The *second* important character is the presence or absence of minute spines upon the second longitudinal vein of the wings, similar to those present in all species at the base of the fourth.

The *third* is whether the hind tibiæ of the males are bearded or not with long soft and often thick hairs.

The *fourth* is whether the second abdominal segment is armed like the third with two strong central spines upon its posterior margin.

The *fifth* is the number of bristles in the two longitudinal rows

upon the dorsum of the thorax, some species having four, many only three, and a few only two, behind the transverse suture (see figs. 1, 2, 3).

Besides these important characters, there are some others of secondary value, which are often useful for the determination of nearly allied species; for instance, the presence or absence of the costal spine upon the wings, the width of the frontal space between the eyes, the size of the bristles upon the cheeks, &c.

To facilitate the description of the species, I shall first arrange them in an analytical manner, and in so doing, shall closely follow the method adopted by Rondani in the 5th vol. of his "*Prodromus Diptero-logiæ Italicæ*," a work from which I have derived much valuable information respecting this genus.

ANALYTICAL ARRANGEMENT.

- A. Apex of abdomen black or grey in both sexes.
- B. Wings without spines upon the second longitudinal veins.
- C. Posterior tibiæ of ♂ bearded on their inner sides.
- D. Abdomen with two spines in the centre of the edge of the second segment.
- E. Thorax with four bristles behind the transverse suture in the two dorsal rows.
 - 1. *CARNARIA*, Lin.
- EE. Thorax with only three dorsal bristles behind the suture.
 - a. First anal segment shining black in ♂.
 - 2. *ALBICEPS*, Meig.*
 - aa. First anal segment grey in ♂.
 - 3. *ATEOPUS*, Meig.
- DD. Second abdominal segment without central dorsal spines.
- F. Thorax with four dorsal bristles behind the suture.
 - 4. *SIMILIS*, *sp. n.*
- FF. Thorax with three dorsal bristles behind the suture.
 - b. First anal segment of ♂ extruded and shining black.
 - 5. *MELANURA*, Meig.
 - bb. First anal segment of ♂ mostly retracted, and, when exposed, grey, not black.
 - 6. *AGRICOLA*, Meig.
- CC. Posterior tibiæ of ♂ without beards on their inner sides.†
- G. Abdomen with two central spines upon the edge of the second segment.
- II. Arista with short hairs.
 - a. Arista almost bare. Third joint of antennæ thickened.
 - 7. *LATICORNIS*, Meig.
 - aa. Arista with short, but distinct, hairs at the base. Third joint of antennæ of the ordinary shape.
 - 8. *NIGRIVENTRIS*, Meig.
- HH. Arista with long hairs.
 - b. Posterior tibiæ of ♂ with a few long hairs upon their inner sides.
 - c. Surface of abdomen tessellated in the ordinary manner.
 - 9. *JUVENIS*, Rond.
 - cc. Abdomen marked with three longitudinal black lines.
 - 10. *CLATHEATA*, Meig.

* In this and the following species, as well as in many others, it is exceedingly difficult to determine the ♀ unless it is captured along with the ♂, as the distinctive characters are peculiar to the latter sex.—R. H. M.

† In some species there are a few scattered hairs.—R. H. M.

GG. Abdomen without central spines upon the edge of the second segment.

a. Abdomen tessellated in the ordinary manner. Posterior tibiæ of ♂ clothed with short soft hairs.

11. ADOLESCENS, Rond.

aa. Abdomen with a black central dorsal line, and lateral spots upon the posterior margins of the segments. Posterior tibiæ of ♂ bare.

12. AFFINIS, Fall.

BB. Wings with spines upon the second longitudinal veins.

a. Abdomen tessellated in the ordinary manner.

13. SETIPENNIS, Rond.

aa. Abdomen with the spots or patches arranged in lines.

b. Eyes near together.

14. DISSIMILIS, Meig.

bb. Eyes wide apart.

15. INFANTULA, Rond.

AA. Apex of abdomen red in both sexes.

I. Wings with the second longitudinal veins unarmed.

J. Posterior tibiæ of ♂ bearded upon their inner sides.

K. Abdomen with two central spines upon the edge of the second segment.

16. HÆMORRHOIDALIS, Zett.

KK. Second abdominal segment without central spines.

a. Black frontal stripe wider than the interval between the stripe and the eye on each side.

17. NUBUS, Rond.

aa. Frontal stripe equal in width to the space between it and the eye.

18. CRUENTATA, Meig.

JJ. Posterior tibiæ of ♂ bare.

19. HÆMATODES, Meig.

II. Wings with spines upon the second as well as the fourth longitudinal veins.

20. HÆMORRHOA, Meig.

1. CARNARIA, Lin., Meig., Macq., Zett., Walk., Schiner, Rond.

striata? Meig., Macq., Walk., Zett., Sch.

cærulescens? Zett., Rond.

Yellowish or whitish-grey, striped and tessellated with black. Posterior tibiæ of ♂ with long and thick beard; middle tibiæ also more or less bearded. Four bristles in the dorsal thoracic row behind the transverse suture, and two central spines on the margin of the second abdominal segment. Length, 4—8 lines.*

Head: forehead and face prominent, the latter varying in colour from pale golden-yellow to pure white, with dark grey reflections when viewed laterally. Frontal space from one-fourth to one-fifth of the width of the head in breadth in ♂, and about one-third in ♀. Frontal stripe black. Setæ upon the cheeks very small. Arista with loush hairs.

Thorax and Scutellum grey. Three broad black stripes extend the whole length of the back, and are continued more or less distinctly over the scutellum; two irregular or broken stripes are also placed on each side. Ten or twelve bristles are arranged upon the sides in two or three irregular rows, and six or seven others in a line upon each of the two lateral broad stripes upon the dorsum, four of which are always placed behind the transverse suture and two or three before it. Of the posterior ones the two hindmost are the largest, then comes a small one which is sometimes obsolete, and in front of this a stronger one, though

* By a line, I mean one-twelfth of an inch, or slightly more than two millimètres.—R. H. M.

less than either of the two hindmost. Of those in front of the suture two are generally large, with a small one between them, and there are often one or two other minute ones nearer to the head (see fig. 1).

Abdomen tessellated on the upper surface with black, grey, and white patches, which reflect the light differently when viewed in different directions, but which, when looked at from behind, appear to be arranged in three black lines, and in four rows of more or less confluent white spots. First segment almost unarmed, second with



two spines placed near together in the middle of the posterior edge, and two or three others on each side. Third segment also with two central spines, and four or five lateral ones on each side, all attached to the edge of the segment. Fourth segment fringed with spines. Both anal segments in ♂ more or less extruded, covered with hairs, and shining black, but having a grey incision between them. Both thorax and abdomen in ♀ are armed as in the ♂, but the spines and bristles are smaller, and sometimes obsolete.

Wings: base and course of the veins more or less clouded with brown, costal spine small or wanting, generally more distinct in ♀ than in ♂. Fourth longitudinal vein armed with nine or ten short spines or teeth, which extend along its base for nearly half the distance from its point of junction with the third longitudinal, to the place where it meets with the internal transverse vein. Fifth longitudinal vein bent at a sub-acute or right angle. External transverse vein more or less sinuous.

Legs: spines and hairs numerous. All the femora thickly ciliated on their under-surfaces; those of the posterior legs armed in addition with numerous strong spines. Tibiæ all furnished with several strong spines upon their outer sides, in addition to those at their extremities; they are very numerous upon the hinder legs. The inner surfaces of the posterior tibiæ of the ♂ are bearded with long hairs along their lower two-thirds, and there is also a short beard upon the hinder surfaces of the middle tibiæ, which becomes gradually shorter from the distal and upwards. These hairs upon the middle pair of legs vary greatly in length in different specimens, being generally longest in the largest individuals. Those in which the beard upon the middle tibiæ is very long, have been considered specifically distinct by Rondani, and constitute his species *cærulescens*.* In small specimens the hairs and spines are all smaller in proportion. In the ♀ the legs are not ciliated, and are armed with fewer spines than in the ♂.

This fly is common almost everywhere. It is described as being viviparous, and its larvæ are said to be deposited in either decaying animal or vegetable substances. The pupæ of this and other species of *Sarcophaga* have often been found in the dung of animals, but this does not prove that the larvæ have lived upon it. Mr. Verrall forwarded to me several specimens of a species with a red abdominal extremity (*cruentata*) which he had bred from pupæ found in pigeon's dung. In this dung were also found the remains of dead pigeons, and it is probable that they had been the food of the larvæ.

* Rondani considers his species to be identical with the *S. cærulescens* of Zetterstedt, but the latter author says nothing about the beard upon the middle tibiæ of the ♂. R. H. M.

2. ALBICEPS, Meig.? Macq.?

Grey, marked and tessellated with blue-black. Face pure white. Middle tibiæ shortly and evenly ciliated. Both anal segments of ♂ black. Three dorsal thoracic bristles behind the suture.

Length 4—5 lines.

This species differs from *S. carnaria*, in being usually smaller, and of a more oval form; the colour is bluer; the face silvery-white, and less prominent; the stripes upon the thorax are wider, and less distinct; the thoracic bristles differ in number, there being only three behind the suture, and two in front of it; all of which are much longer and stronger, and of more even size, than those in *S. carnaria*, see Fig. 2.* The costal spine is usually more distinct; the beard upon the posterior tibiæ less thick; and the middle tibiæ are only clothed with short hairs, of an even length, along the whole surface. The ♀ is very similar to the ♂, with the exception of the usual sexual differences.

This species is not common: I have one ♂ in my own collection, and there are one ♂ and one ♀ in that of Mr. Verrall, one of which was captured at Lewes, Sussex, and the other at Lyndhurst, Hants.†

I have called this species *albiceps*, as in colour and general characters it resembles the one so named by Meigen; but the description of his species is so imperfect, that it is impossible to identify it with certainty.

3. ATROPOS, Meig., Macq., Zett., Schin.

Grey, striped and tessellated with black. Three posterior dorsal thoracic bristles. First anal segment in ♂ grey, often marked with lines or spots.

Length, 3—4 lines.

This well-marked species closely resembles the smaller specimens of *S. carnaria*, both in general form, colour, and markings; but it differs from them essentially, in having only three bristles in the posterior part of the dorsal thoracic row, and two in the anterior part, which in size and arrangement resemble those of *S. albiceps*. It also differs from both the preceding species by the colour of the first anal segment of the ♂, which, instead of being shining black, is pale grey, marked by a transverse and sometimes a vertical dark line, and in some specimens with two lateral small dots. This design upon the anal joint is frequently partial or indistinct, and often altogether wanting; the segment being of a plain grey colour. The legs are armed and ciliated as in small varieties of *S. carnaria*, there being a short beard upon the middle tibiæ of ♂. The ♀ is not known.

* Though this figure is intended to represent *S. melanura*, the thoracic part will equally apply to both.—R. H. M.

† I beg to express my thanks to Mr. Verrall for his kindness in placing his large and valuable collection of *Sacrophagidae* at my service.—R. H. M.

This species is not common, but seems to be generally distributed in England and Scotland.

4. *SIMILIS*, *n. s.*

Colour and markings as in *S. carnaria*. Thorax with four posterior dorsal bristles. Second abdominal segment destitute of central spines upon the edge. Length, 4—7½ lines.

This species only differs from *S. carnaria* in one essential point, viz., by the central portion of the edge of the second abdominal segment being unarmed with spines. The bristles in the dorsal thoracic rows are similar in number, size, and arrangement to those in species 1. The specimens vary in size greatly, as in that species; and the legs are ciliated in the same manner, many of the large specimens having quite a long beard upon the middle tibiæ of the ♂, when they correspond to the *S. matertera* of Rondani. The ♀ resembles the ♂, except in the hairiness of the legs, and in the width of the frontal space.

Generally distributed, but much less common than *S. carnaria*.

5. *MELANURA*, Meig., Macq., Zett., Walk., Rond.

Yellowish-grey, striped and tessellated with brownish-black. Frontal space wide. Thorax with three posterior dorsal bristles. Second abdominal segment without central spines. First anal segment in ♂ black, and extruded. Costal spine of wings distinct.

Length 4—5 lines.

Head: forehead rather less prominent than in *S. carnaria*. Frontal space equal in width in ♂ to one-third of the head, and equal to nearly half in ♀.

Thorax: three posterior and two anterior dorsal bristles, as in *S. albiceps*.

Abdomen without central spines upon the edge of the second segment. Both the anal segments in ♂ shining black, the first extruded. *Wings* mostly with a distinct costal spine. *Legs* with middle tibiæ of ♂ shortly ciliated. In general colour and design similar to *S. carnaria*, but the black is usually of a more rusty tint, and the white and grey spots on abdomen are sometimes of an olive tint.

The ♀ resembles the ♂.

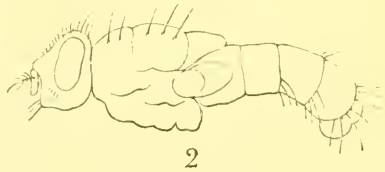
This well-marked species is generally distributed.

6. *AGRICOLA*, Meig.?, Macq.?, Zett., Rond.

Yellowish-grey, striped, and tessellated in black, in the ordinary manner. Buccal setæ a little enlarged. First anal segment of ♂ grey, and mostly retracted. Posterior tibiæ of ♂ thinly bearded.

Length, 3—4 lines.

This species resembles *S. melanura* in the number of thoracic dorsal bristles, and by the absence of central spines upon the second abdominal segment; but it differs in having the frontal space narrower (it not occupying more than one-fourth of the width of the head in



the δ), it is also usually smaller, and more slender in shape, has the first anal segment of the δ retracted and grey in colour, and the posterior tibiae of the δ less thickly bearded. The buccal setae in *S. Agricola* are usually considerably larger than in *S. carnaria* and all the preceding species. There is a great likeness between this species and *S. Atropos*, but it may at once be distinguished from the latter by the absence of the two central spines upon the edge of the second abdominal segment.

Not uncommon.

7. LATICORNIS, Meig., Rond.

Bluish-grey, marked with black stripes and spots. Third joint of antennae rather broad. Arista bare. Vibrissae numerous and large. Two central spines on the second abdominal segment.

Length, 4 lines.

Head: forehead prominent. Face white, with blue reflections. Frontal space occupying about one-fourth of the width of the head in the δ . Edges of the facial groove setigerous. Third joint of antennae wide. Arista thickened at the base, and almost bare. Peristome with numerous and large vibrissae.

Thorax rather indistinctly striped. Dorsal bristles large, three placed behind the suture.

Abdomen with two strong central spines upon the edge of the second segment, and with the third as well as the fourth segment fringed with numerous strong spines. The dorsum is marked by an interrupted black stripe down the centre, and the posterior margin of each segment is marked upon each side by a semi-circular black spot. The ordinary tessellations or reflections are less distinct than in most of the preceding species. *Wings* tinged with brown. *Legs* furnished with strong spines, but with no beard upon the tibiae of the δ .

♀ very similar to the δ , but with a wider frontal space.

This is a well-marked but aberrant species, bearing a strong resemblance to some of the *Tachinidae*, the arista being thickened and without hairs, and the facial groove setigerous. Not rare.

8. NIGRIVENTRIS, Meig., Rond.

Grey, striped and tessellated in the ordinary manner. Frontal space wide. Buccal setae large, style thickened, and with short hairs. Ventral surface of abdomen mostly black. Length, 2—3 lines.

Head: frontal space occupying about one-third of the width of the head in δ . Buccal setae large. Third joint of antennae rather large, but of the ordinary form. Arista thickened at the base, and furnished with short hairs.

Thorax with three posterior dorsal bristles.

Abdomen with two central spines upon the edge of the second segment. Ventral surface sometimes black, but often grey. *Wings* with a distinct costal spine. *Legs* without beard upon the posterior tibiae of the δ .

♀ similar to the δ , but usually larger in size. Frontal space wider.

This species resembles *S. agricola* in having the bristles upon the cheeks enlarged; but it differs in being smaller, and in having the posterior tibiae of the δ bare. Not common.

9. JUVENIS, Rond.

Grey, striped and tessellated in the ordinary manner. Style with long hairs. Costal spine large. Posterior tibiae of ♂ ciliated, with a few long hairs on their inner sides. Length, 3 lines.

Head: frontal space in breadth about one-fourth of the width of the head. Buccal setae small, arista with long hairs.

Thorax with three posterior dorsal bristles.

Abdomen with two central spines on second segment. Anal segments of ♂ both shining black. *Wings* with a long costal spine. Fifth longitudinal vein bent at an obtuse angle.

Legs: posterior tibiae furnished on their inner sides with a few long hairs.

I have seen but one ♂ of this rare species, which is in Mr. Verrall's collection.

10. CLATHRATA, Meig., Rond.

Blue-grey. Abdomen marked with three longitudinal black lines. Frontal space narrow. Hind tibiae of ♂ with a few longish hairs. Length, $2\frac{1}{2}$ lines.

Head: breadth of frontal space not more than one-sixth of the width of the head. Style with moderately long hairs.

Thorax rather indistinctly striped. Three dorsal bristles behind the suture.

Abdomen with the second segment armed with two spines in the centre. First segment black, the three others pale grey, marked with three continuous longitudinal black lines, which are expanded but not broken at the posterior edges of the segments, so as to give somewhat the appearance of a series of connected triangular spots. First anal segment of ♂ grey, second black. *Legs*: posterior tibiae of ♂ with a few straggling longish hairs on their inner sides.

♀ said to resemble the ♂.

This small species bears a very close resemblance to *S. dissimilis* (No. 14), but may at once be distinguished from it by the absence of teeth upon the second longitudinal vein of the wings. Rare. I have one ♂ in my own collection.

11. ADOLESCENS, Rond.

Grey. Thorax and abdomen marked in the ordinary manner. Second abdominal segment without central spines. Posterior tibiae of ♂ thickly clothed with soft short hairs. Length, 3 lines.

Head: frontal space about one-fourth of the width of the head.

Thorax with three posterior dorsal bristles.

Abdomen tessellated in the ordinary manner, and without central spines upon the edge of the second segment. *Wings* with costal spine small. *Legs* with the posterior tibiae of ♂ lined along the lower two-thirds of their inner surfaces with short soft hairs.

♀ unknown.

Rare. There is one ♂ in Mr. Verrall's collection, taken at Folkestone.

12. *AFFINIS*, Fall., Meig., Macq., Zett.

Whitish-grey, with black lines and spots. Frontal space narrow. Abdomen marked by a single longitudinal line, and with black spots on the posterior margins of the segments. Length, $3\frac{1}{2}$ —4 lines.

Heads : eyes of ♂ near together, being separated by a very narrow frontal space, which is often of a reddish-brown colour. Style with rather short hairs.

Thorax striped in the ordinary manner, and with three posterior dorsal bristles.

Abdomen without central spines on second segment. First segment black, second, third and fourth grey, marked with a central black longitudinal line, rather irregular in width, and sometimes interrupted at the sutures, and with six large, black, somewhat triangular shaped spots, one of which is placed at the side of the posterior margin of each segment. Anal segments of ♂ small and grey in colour. *Wings* with no costal spine. Internal transverse vein nearly opposite the end of the second longitudinal, which extends considerably beyond it in most species. *Legs* with posterior tibiae of ♂ bare.

♀ similar to ♂, but with the frontal space as wide as one-fourth of the head.

Not rare.

13. *SETIPENNIS*, Rond.

Yellowish-grey, striped and tessellated in the ordinary manner. Second as well as fourth longitudinal vein of wings armed with teeth. Costal spine large. Second abdominal segment with central spines.

Length, 3 — $3\frac{1}{2}$ lines.

Head : frontal space of ♀ as wide as one-third of the head. Style with long hairs, bristles upon the cheeks a little enlarged.

Thorax with three dorsal bristles behind the suture.

Abdomen with two central spines upon the edge of the second segment. Tessellated in the ordinary manner. *Wings* : second longitudinal vein armed with teeth along nearly its whole length. Fourth vein with teeth at the base as in all other species. Costal spine large.

Rare. I have not seen a ♂ of this species, and only three ♀, one of which is in Mr. Verrall's collection, taken at Ranscombe, one is in my own collection, and I received one from the late Mr. F. Walker.

14. *DISSIMILIS*, Meig., Schin.

Grey. Abdomen of ♂ marked with three longitudinal black lines. Abdomen of ♀ shining black, with small white spots upon the sides. Frontal space narrow. Wings tinged with brown, and with the second longitudinal vein denticigerous. Posterior tibiae of ♂ with a few long scattered hairs. Length, 2—3 lines.

Head : frontal space occupying about one-sixth of the width of the head in ♂, and one-fourth in the ♀. Bristles of cheeks of ordinary size.

Thorax marked in the usual manner, and having three posterior dorsal spines.

Abdomen narrow in ♂, with two central spines upon second segment. First segment shining black, the three following ones grey, marked with three longitudinal black lines, formed by a series of triangles, the bases of which are placed backwards. Anal segments

both shining and black. In ♀ all the segments are shining black, but have a small white spot on the lateral edge of each, which is only visible in certain lights. *Wings* with a smoky tinge, which is especially marked along the anterior border. Costal spine large. Second longitudinal vein armed with minute teeth along its anterior half. Fourth with the teeth extending as far as the internal transverse vein. *Legs* with a few scattered long hairs on the inner sides of the posterior tibiae of ♂.

Not rare. I captured several ♂ of this pretty little fly at Tingewick, near Buckingham, on 2nd August, 1873, but did not see a single ♀. On the 17th September in the following year, I took four ♀ in the same locality, but found no ♂.

15. INFANTULA, Rond.

Grey. ♂ striped and marked as in *S. dissimilis*. Frontal space wide. Posterior tibiae of ♂ with inner sides bare. Second longitudinal vein denticerous. Length, 2 lines.

Head: frontal space nearly equal to one-third of the width of the head in ♂.

Thorax striped in the ordinary manner, and having three posterior dorsal bristles.

Abdomen having the second segment armed with two long erect central spines. Form and design much as in *S. dissimilis*, but with the lateral rows of triangular spots less distinctly formed. *Wings* armed as in *S. dissimilis*, but less tinged with brown. *Legs* without any long hairs upon the inner sides of the tibiae of ♂.

♀ unknown.

Rare. There is one specimen in Mr. Verrall's collection, captured at Reigate, Surrey.

16. HÆMORRHOIDALIS, Zett., Rond.

Grey. Marked and tessellated as in *S. carnaria*. Four thoracic bristles behind the suture. Abdomen with two central spines upon the edge of the second segment. First anal segment of ♂ shining black, second red. Costal spine of wings distinct. Second longitudinal vein without teeth. Beard upon the posterior tibiae of ♂ thin and short. Length, $4\frac{1}{2}$ —5 lines.

This species closely resembles *S. carnaria* in all points except the following. It never attains to the size of some specimens of the latter; the terminal segment of the abdomen is red; the costal spine is larger; and the posterior tibiae of the ♂ are more thinly and shortly bearded, the hairs only extending a short way up the leg.

The ♀ closely resembles that of *carnaria*, but has the tip of the abdomen red.

Rare. I received a ♂ of this species from the late Mr. F. Walker, and captured one ♀ at Bowdon, Cheshire, in June, 1875.

I have not mentioned the names of either Fallén, Meigen, Macquart, Walker, or Schiner, in the synonyms of this species, for their descriptions of *S. hæmorrhoidalis* either apply to the next species, or are so imperfect, that it is impossible to say to what species they refer.

17. *NURUS*, Rond.*hæmorrhoidalis*, Schin., Meig.?, Macq.?

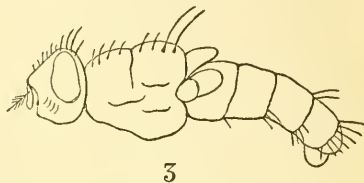
Grey, marked and tessellated as in the preceding species. Thorax with only two dorsal bristles behind the suture. Second abdominal segment without central spines. First anal segment of ♂ grey, second red. No costal spine to wings. Fifth longitudinal vein bent at an acute angle. Posterior tibiæ of ♂ with a thick beard.

Length, 5—6 lines.

Head: face pale golden-yellow or grey. Frontal space occupying one-fourth of the width of the head. A distinct black or brown stripe runs down the middle of this space, which stripe is wider than the interval that separates it on each side from the eye.

Thorax with only two large bristles in the dorsal row, both of which are at the posterior part behind the suture, all the others, both before and behind the transverse suture, are very small or almost obsolete (see figure 3).

Abdomen without spines in the centre of second segment. First anal joint of ♂ extruded and grey, second red. *Wings* without costal spine. Fifth longitudinal vein bent at an acute or sub-acute angle. *Legs* with posterior tibiæ of ♂ thickly, but not longly, bearded.



♀ similar to ♂, except in the usual sexual differences.

Common.

18. *CRUENTATA*, Meig., Rond.

Whitish-grey, striped and tessellated in the ordinary way. Frontal stripe equal in width to the space between it and the eye on each side. Fifth longitudinal vein bent at an obtuse or right angle. First anal segment of ♂ retracted.

Length, $3\frac{1}{2}$ — $4\frac{1}{2}$ lines.

Head: face silvery-white. Frontal space rather wider than in *S. nurus*, with a dark red or black stripe running down the centre, which is equal in width to the interval on each side between it and the eye, which is of a whitish colour.

Thorax with dorsal line of thoracic bristles as in *S. nurus*

Abdomen without central spines on second segment. Anal segments of ♂ smaller in proportion than in *S. nurus*, the first retracted and grey, the second red. *Wings* with the fifth longitudinal vein bent at a more obtuse angle than in *S. nurus*. *Legs* bearded as in *S. nurus*.

♀ similar to ♂, only frontal space wider.

Rare. Mr. Verrall's collection contains two ♂ and two ♀, all of which were bred from pupæ found in pigeon's dung, at Croydon, Surrey, in which were the remains of dead pigeons.

19. *HÆMATODES*, Meig., Macq., Zett., Schin., Rond.

Yellowish-grey, striped and spotted with brownish-black. Frontal

space wide. Thorax with three posterior dorsal bristles. Posterior tibiæ of ♂ bare. Length, 3 lines.

Head: width of frontal space in ♂ rather more than a fourth of the breadth of the head. Central stripe black, and rather more than double the width of the whitish-coloured interval between it and the eye on each side.

Thorax striped in the usual manner, and armed with five large dorsal bristles, two in front and three behind the transverse suture, as in *S. melanura* (figure 2).

Abdomen without central spines upon the edge of the second segment. Dorsum marked by a longitudinal central stripe, formed by three elongated triangular black spots. Sides tessellated with irregularly-shaped black spots. First anal segment of ♂ pale grey, second light red. Terminal segments of ♀ reddish-brown. *Wings* without costal spine. *Legs* with posterior tibiæ of ♂ smooth.

Rare. Two ♂ and one ♀ of this species are in Mr. Verrall's collection, all captured at Penzance.

20. HEMORRHOA, Meig., Zett., Schin., Rond.

vulnerata, Schin.

Yellowish or whitish-grey, striped and tessellated with black. Frontal space narrow. Second and fourth longitudinal veins of wings setigerous. Second abdominal segment with two central spines. First anal segment of ♂ black, with a grey spot, second red.

Length, 3—4 lines.

Head: frontal space of ♂ not more than one-sixth of the width of the head in breadth, and entirely black. In ♀ the space is nearly twice as wide.

Thorax marked and armed as in *S. hæmatodes*.

Abdomen with second segment armed with central dorsal spines upon its posterior edge. Colour pale grey, tessellated with three longitudinal rows of black irregularly-shaped confluent spots. First anal segment of ♂ black, marked with a grey patch, second dull red. Terminal segment of ♀ pale yellowish-red. *Wings* with base tinged with brown. Costal spine small, but generally distinct. Second as well as fourth longitudinal veins setigerous. Fifth longitudinal vein bent at a right or obtuse angle. *Legs* with the posterior tibiæ of ♂ either bare, or ciliated with a few longish hairs when it constitutes the species *vulnerata* of Schiner.

Not rare.

In conclusion, I may remark, that while investigating the minute differences which separate the species of this genus from each other, the question will arise, are these differences in structure sufficient, in many cases, to separate these flies from each other as specifically distinct, or are they only varieties of one or two types? I can only say in answer, that the characters upon which the foregoing species are founded, will be found to be mostly constant and fixed, and that one distinctive point of difference is almost always accompanied by some other. The only species about which I have any doubt, is No. 4,

which I have named *similis*, from the close resemblance which it bears to *S. carnaria*, differing from it only by the want of the dorsal spines upon the edge of the second abdominal segment. In female specimens of *S. carnaria*, these spines are sometimes small and absent; and in a few males I have found them much less than usual: it must therefore remain to be determined by future investigations whether *S. similis* is to be ranked as a true species, or only a variety of *S. carnaria*.

Bradford, Yorkshire:

November, 1875.

R.H. Meade.

Notes. o. t. Anthomyda.
of N. America.

1878.

with). The fourth joint of the antennæ white, brown only at the apex. Head cinnamon-brown. On *Pinus*.

1. *P. BIFASCIATUS*, Fabr., Zett.

2 (1). Body narrower, posteriorly more widening. The space on the corium between the posterior band and the apex, *only between the cubital nerve and the exterior margin*, piceous, shining. The fourth joint of antennæ only at the base whitish, but the third joint on the basal half whitish or testaceous.

3 (8). Upper-side without long, straight hairs.

4 (5). Head dark cinnamon-brown, very little narrower than the base of the pronotum. The colour of the elytra cinnamon-brown; the posterior band of the corium quite straight (the band across the clavus in a line therewith). The second joint of the antennæ only about one-fifth longer than the basal width of the pronotum. Food-plant unknown. From Greece ... 2. *P. PUSILLUS*, n. sp.

5 (4). Head and thorax fuscous, more or less with a bronzy tint. Head considerably narrower than the base of pronotum. The colour of the elytra dark brown or olive-brown, with a dull velvety appearance in certain lights.

6 (7). The transverse band of the clavus a very little *above* the posterior band of corium, and *united* thereto; the latter a little oblique and curved. The second joint of the antennæ very little or scarcely longer than the posterior width of the pronotum. On *Quercus* ... 3. *P. PERPLEXUS*, D. & S.

7 (6). The transverse band of the clavus distinctly above the posterior band of the corium, and *not united* thereto; the latter straight; the second joint of the antennæ at least one-third longer than the basal width of the pronotum. On *Salix*, *Populus*, *Betula*, *Alnus* ... 4. *P. CLAVATUS*, Linn.

8 (3). Upper-side, with long straight hairs. On *Salix* and *Alnus incana*.

5. *P. CONFUSUS*, Kirschb.

Obs.—Mr. Saunders (Synops., p. 287) has described *P. bifasciatus* as *narrower* than *clavatus*, but this is not correct. Kirschbaum has already said (Rh. Wiesb., p. 137) that his *cinnamopterus* differs from *clavatus* by the *broader* pronotum. Is it possible that the British Hemipterists have confounded two species? *P. bifasciatus* in Sweden and Finland is found only on *Pinus* (Prof. Kirschbaum has also taken this species on *firs*), but Mr. Saunders and Dr. Fieber indicate that it lives also on oaks. This, if referring to one species, would be a very peculiar feature, for scarcely any other of the *Capsidæ* lives on *Coniferæ* and also on foliage-trees.

PILOPHORUS CLAVATUS (Cat., 35, 3). *Capsus bifasciatus*, Sahlb., Mon. Geoc., 91, 1, cited by the authors as identical with this species, belongs to *Culocoris biclavatus*. I have examined the types of Sahlberg.

(To be continued).

NOTES ON AFRICAN HEMIPTERA-HETEROPTERA.

BY W. L. DISTANT.

SCUTATA.

CANTHARODES RUTHERFORDI, *n. sp.*

Ochraceous, variegated with black punctures, which are generally confluent. Head, with apical half of central lobe and suture of lateral lobes, black. Eyes pitchy. Antennæ black, pilose, first joint luteous at base, first and second joints longest, sub-equal, third rather shorter than fourth. Rostrum ochraceous, pitchy, tip black. Pronotum with a median transverse impression. Scutellum with a transverse impression near the base, enclosing a narrow space, which is broadest at the centre; immediately behind this it is prominently gibbous and slightly ridged on the disc, from which to the apex it is abruptly deflexed. The ground colour of the anterior half of the pronotum, and of the enclosed space at the base of the scutellum, slightly ferruginous. Under-side of body and legs black; apices of tibiæ and basal joints of tarsi thickly setose, ochreous. Long. 16 mill.; greatest lat. 14 mill.

Camaroons (Rutherford).

Differs from *C. cænosa*, Westw. (the only other known species of the genus), in being much more irregularly punctured, and in the different colour of the fore and middle tibiæ, which, in *C. cænosa*, is luteous. The 4-lobed space across the pronotum of that species is only faintly indicated in *C. Rutherfordi*, which can also be recognised by the more gibbous and posteriorly deflexed scutellum. The pygidium is also slightly exserted, which character Prof. Westwood informs me is not exhibited in either sex of *C. cænosa*.

COPTOSOMA HILARIS, Walk., Cat. Hem.-Het., pt. 1, p. 85, No. 18.

= COPTOSOMA PARTITA, *id.*, *l. c.*, No. 20.

From a careful examination of the types of the above in the Brit. Mus., the only difference I can detect is in the phraseology of the description.

STENOZYGUM SCULPTICOLLE, Stål.—*Strachia sculpticollis*, Stål, Ö. V. A. F., 1855, p. 182, 1; *l. c.*, p. 59, 1. *Stenozygum sculpticolle*, Stål, Hem. Afr., i, p. 185, 4 (1864).

This species is subject to great variation, and, having examined a large number of specimens, extreme forms of which viewed alone might mislead as to specific value, I herewith give diagnoses of the varieties.

Var. a. Posterior border of prosternum, mesosternum, and metasternum, coxæ, trochanters, and base of femora, luteous.

Mongo-ma-lobah. Isubu (W. Africa).

Var. b. Similar to *var. a.*, with the addition of two irregular black spots at the base of the scutellum, divided by a central yellow fascia, which does not extend beyond the central elevated portion. Disc of abdomen beneath yellowish. Membrane brassy-green.

Camaroons.

Var. c. Two irregular and inconstant spots on the disc of the pronotum, which in some specimens are linear, in others very waved and having almost the appearance of being four in number; in others they are amalgamated into one spot. A broad band extends across the base of the scutellum and coria, dark bluish. On the under-side the pectoral spots coalesce. The ground colour of this variety ranges from bright yellow to purplish-red, and the membrane, generally pale ochreous, is, in some specimens brassy-green.

Mongo-ma-lobah. Camaroons.

Var. d. Head and pronotum dark bluish, the latter with an irregular median reddish streak, extending from the anterior to the posterior borders, widening posteriorly in some specimens. Scutellum and coria marked as in *var. c.* Abdomen below with a sub-marginal row of four, somewhat rounded, spots, and an irregular apical one, dark bluish.

Mongo-ma-lobah. Camaroons.

BATHYCELIA DISTINCTA, *n. sp.*

Sub-ovate, lateral angles of pronotum slightly prominent; greenish-testaceous above, thickly and finely punctured. Head and anterior half of pronotum pale greenish-yellow, the last of which is much less densely punctured, and has a transverse row of four greenish-testaceous spots. Antennæ obscure olive-green, apex of third and fourth, and apical half of fifth joint, black; third joint longer than the second, fourth and fifth equal. Membrane brassy. Rostrum, legs, and under-side of body, pale olive-green. Apex of rostrum pitchy. Tibiæ setose. Long. 13—15 mill.

Isubu.

Apart from structural characters, its smaller size and the transverse row of four spots on the anterior half of the pronotum, at once distinguish *B. distincta* from the other three species of *Bathycelia* at present known to science.

1, Selston Villas, Derwent Grove,
East Dulwich.

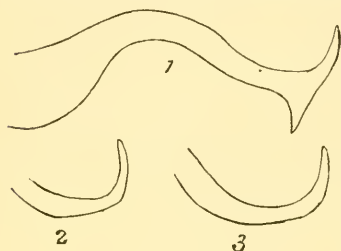
March 2nd, 1878.

DESCRIPTION OF A NEW BRITISH *TYPHLOCYBA*.

BY JAMES EDWARDS.

TYPHLOCYBA DOUGLASI, *n. sp.*

♂ deep yellow, inclining to orange; ♀ paler, with the elytra milk-white; apex of elytra broadly fuscous in both sexes.



Crown somewhat obtuse. Pronotum nearly one-third longer than the crown. Elytra in ♂ deep yellow inclining to orange, in ♀ milk-white, the apex broadly fuscous in both sexes, the limits of the colour sharply defined and extending inwardly from the base of the first or costal cell to a point about the apical seventh of the claval suture. Nerves of the membrane deep yellow in ♂, paler in ♀. Wings

opaque white, nerves distinctly yellow.

Length, $1\frac{1}{2}$ line. Expanse, 3 lines.

This very distinct species, which I have great pleasure in naming in honour of my esteemed friend Mr. Douglas, is remarkable for the great development of the genital appendages in the male, these being nearly twice as large in proportion to the size of the insect as in any other species with which I am acquainted. The accompanying figures of the *inner* genital process of *T. Douglasi* (1), *T. rosæ* (2), and *T. cratægi* (3) will serve to show the excessive development of those parts in the first named species. The species is scarcely likely to be confounded with any other, except perhaps that the female might be passed over as a variety of *rosæ*, with which species it agrees in the neururation of the wings.

Beaten from fir in March and blackthorn in September, in two localities near Norwich.

Bracondale, Norwich:
11th March, 1878.

DESCRIPTIONS OF SIX NEW SPECIES OF *SPHINGIDÆ*.

BY HERBERT DRUCE, F.L.S.

CHÆROCAMPA BELTI, *n. sp.*

General appearance of *C. virescens*; primaries much darker green, mottled with pale, glossy, blue-green; a black spot at the end of the cell, and a pale line crossing the wing from the middle of the inner margin to the apex. Secondaries black, crossed near the middle by a dull green band; the outer margin green; body above dark green, below red, with a row of white spots on each side. Under-side: primaries red, shaded with green and brown near the apex; secondaries red, crossed below the middle by an indistinct brown line.

Exp. $3\frac{3}{4}$ inch.

Hab.: Nicaragua.

Mus. T. Belt.

CHÆROCAMPA SALVINI, n. sp.

Primaries dark red-brown, palest near the anal angle, the costal margin and the apex pale brown, a pale brown line crossing the wing from the inner margin near the base to the apex. Secondaries dark brown, the fringe white. Under-side dark brown, shaded with red and yellow, an indistinct pale line crossing the wing near the outer margin. Abdomen above dark brown, with a pale line down the middle, sides pale brown; under-side almost white.

Exp. $2\frac{1}{4}$ inch.*Hab.* : Guatemala (O. Salvin).

Mus. Druce.

CHÆROCAMPA TITANA, n. sp.

Primaries : upper-side brown, crossed from the inner margin to the apex by six pale bands, the two middle ones the widest, the apex very pale brown, a black spot at the end of the cell. Secondaries black, crossed by a band of five pale brown spots. Under-side : primaries pale yellowish-brown, darkest at the base, crossed by several indistinct brown lines; secondaries the same with the outer margin, darker brown. Abdomen brown, with two pale lines down the middle, and a pale line on each side; the under-side much paler brown.

Exp. $3\frac{1}{4}$ inch.*Hab.* : Chiriqui (Arcé).

Mus. Druce.

CHÆROCAMPA LÆLIA, n. sp.

Primaries light brown, crossed by several very indistinct pale lines. Secondaries black, crossed beyond the middle by a reddish-brown band. Under-side pale pinkish-brown, the outer margins of both wings brown. Abdomen brown, palest on the under-side.

Exp. $2\frac{3}{4}$ inch.*Hab.* : Chiriqui (Arcé).

Mus. Druce.

CHÆROCAMPA LIBYA, n. sp.

Closely allied to *C. Lælia*; the primaries darker brown, crossed by seven dark lines. Secondaries black, crossed from the anal angle to near the apex by a band of reddish-brown. Under-side reddish-brown, darkest at the base of primaries; a submarginal row of black spots crossing both wings, the outer margins pale brown. Abdomen dark brown, paler on the under-side; three indistinct lines down the middle on the upper-side.

Exp. 3 inch.

Hab. : Chiriqui (Arcé).

Mus. Druce.

DARAPSA ELARA, n. sp.

Primaries light olive-green, crossed beyond the middle from the inner margin to near the apex by a dark band of green, a dark spot at the end of the cell. Secondaries, from the base to near the middle, black, crossed by a pale green band, the outer margin dark green. Under-side light yellowish-green, thickly irrorated with dark scales; primaries, from the base to near the middle, but not reaching the costal margin, dark brown; two faint waved lines crossing from the apex to the anal angle, the one nearest the outer margin very indistinct. Secondaries crossed by a dark line close to the base. Abdomen greenish-brown above, much paler on the under-side.

Exp. $2\frac{1}{4}$ inch.*Hab.* : Paraguay.

Mus. Druce.

NOTES ON THE *ANTHOMYIIDÆ* OF NORTH AMERICA.

BY R. H. MEADE.

The American *Anthomyiidae* are very little known. Most of the other families of American *Diptera* have been more or less completely investigated, by Say, Loew, Osten-Sacken, and others; but the only entomologist who attempted to describe any of the American flies belonging to the genus *Anthomyia* of Meigen, was the late F. Walker, who, in his list of the *Diptera* in the British Museum, and the "Insecta Saundersiana," recorded a number of new species: his descriptions, however, are so imperfect, that it is impossible to identify many of the species without reference to the types.

Last year, I received, through the kindness of Baron C. R. Osten-Sacken, a considerable collection of North American *Anthomyiidae*, from the Museum of Comparative Anatomy at Cambridge, Mass., with a request that I would examine and compare them with European species: having done so, I have drawn up a few remarks upon the results I obtained, which may be of some interest to British entomologists.

On looking over the collection, it struck me, in the first place, that the number of species was small in proportion to the number of specimens; and next, that the number of the smaller and feebler species was greater in proportion to that of the larger and more highly developed forms, than occurs in Europe. I only determined 121 species in the collection. There were few, if any, peculiar forms among them; they could all be arranged in the same genera, as the European species; they had the same sombre colours and ordinary forms which are so familiar to us; and many of the common European kinds were so closely represented, that it was difficult to say, in some instances, whether they were exactly the same, or closely analogous species.

I will briefly run over the different genera, following the arrangement which I sketched out in vol. xi of this Magazine, pointing out those species which seem common both to America and Europe, and shortly alluding to some others that seem to call for especial notice.

The genus *POLIETES*, of which the well-known *M. lardaria*, Fabr., is the principal species, is not represented in the collection.

In the genus *HYETODESIA* (*ARICIA*, pt. Macq.), I determined seven distinct species, several of which closely resemble European, as *M. lucorum*, Fall., *A. lugubris*, Mgn., and *A. obscurata*, Mgn., but none of them, I think, are quite identical.

In the genus MYDEA (ARICIA, pt. Macq.), I found ten species, only one of which was similar to any in Europe, viz., the common *M. pagana*, Fabr., which has a yellow scutellum.

In SPILOGASTER, there were eleven species, one or two of which closely resembled European species, but were, however, distinct. One fly in this genus possessed several interesting characters, which deserve especial notice. There was only one male in the collection, and it bore a remarkable resemblance to *Cyrtoneura (Myospila) mediatubunda*, Fabr. The fifth longitudinal wing vein was curved in a similar manner towards the fourth vein, though in a less degree; the spots upon the abdomen, and the general colour, size, and appearance, were also very like those of that fly; but it differed in having the eyes naked, and the arista furnished with much shorter hairs.

The genus HYDROPHORIA was represented by three species, all of small size; one of which was similar to *M. ambigua*, Fall.

In the genus DRYMIA, I found, as in Europe, one well-marked species only, which exhibited all the peculiar characters seen in the *M. hamata* of Fallén, but was quite distinct from that common fly.

I only found two species belonging to the genus HYDROTEA, both of which seemed identical with the common European *M. dentipes*, Fabr., and *M. armipes*, Fall.

The genus LASIOPS contained two species, one closely resembling *L. cunctans*, Meig.

In OPHYRA, there were two species, one of which appeared to be identical with the well-known *M. leucostomu*, Fall.

The genus LIMNOPHORA contained eight species, two or three of which closely resembled European ones; but none of them appeared to be quite identical. In the European species of this family, of which the *A. compuncta*, Wdm., is the type, the eyes of the males are sometimes separated by a rather wider space than is usual among the *Anthomyiidae*, except in *Cænosiæ*, *Lispa*, &c., and this character was marked in an exaggerated degree in all the American species, so that it was difficult to determine by the eyes alone, whether they should be placed in the genus *Limnophora* or *Cænosiæ*.

HOMALOMYIA: there were five species belonging to this genus, three of which seemed identical with the common European *M. canicularis*, Lin., *A. scalaris*, Meig., and *A. incisurata*, Zett. It is most probable that these common flies, which abound in and about our houses in Europe, have been imported into America, like the house fly, *M. domestica*.

AZELIA: the only species in this genus corresponded with *A. Stægeri*, Zett.

ANTHOMYIA: in this genus, as now restricted, I determined eight species, one of which seemed identical with *M. radicum*, Lin., and another with *M. pluralis*, Lin.

A large number of small flies in the collection could be referred to the genus CHORTOPHILA: I made out as many as twenty-nine distinct species, several of which were similar to European forms, viz., *C. floccosa*, Macq., *A. angustifrons*, Meig., *A. gilva*, Zett., *A. vittigera*, Zett., and *A. flavo-scutellata*, Zett.

The genus LISPA contained three species, one similar to *L. tentaculata*, De Geer, and another to *L. uliginosa*, Fall.

CARICEA: this genus contained but one species, which seems to be very common in America, as there were numerous specimens of it in the collection; it was of considerable size, and the females bore a remarkable resemblance to those of *M. impuncta*, Fall., but the males were very different, and quite characteristic of the genus.

CÆNOSIA: I made out sixteen species belonging to this genus, many of which were very similar in their characters to European ones; but I could only identify one, which was apparently identical with *A. pygmæa*, Zett.

In conclusion, I must express a hope that some American Dipterist may take up and describe the species of this interesting family inhabiting his own country, which bear, as I have endeavoured to show, such a remarkable affinity to the same tribe of flies in Europe.

Bradford: *March*, 1878.

Natural History of Argynnis Paphia.—As it was from a single example only that I made my observation of the early stages of this species in 1861–62, I was very glad to receive from my friend, the Rev. J. Hellins, in August, 1876, eight eggs, which, with about twice as many more, had been laid by a captured female; and which enabled me to verify and supplement my previous work in a very satisfactory manner. Before giving the dates of each stage in the life-history of the examples, which these eggs produced, I will remark that, as before, the hatching took place about a fortnight after the eggs were laid, and not, as stated by Von Prittwitz (see E. M. M., vi, p. 223), delayed till after hibernation.

The eggs were laid July 30th and 31st, 1876; the larvæ hatched August 13th and 14th, and were placed on potted plants of *Viola canina*; they soon crept under the leaves, and I did not see them again till April 6th, 1877, when I detected one, and subsequently four others, which had survived the perils of hibernation; one of these five I afterwards lost; one, when full-grown, was preserved by Lord Walsing-

R. H. Meade

Musca Hortorum.
etc.

1880.

The Entomologist, London 1880. (19193, 19194)

1880.]

19

En. lat. 4/12 got. 12. 104

the hearings of the breast, until within twenty-five minutes of the event expected, when suddenly most violent writhings and rapid twistings ensued for the space of two or three minutes, and then the slower measured movements were resumed; the skin enveloping the head became glistening and throbbed in parts with a slight inflation, in accord with the general heaving action of the larva; presently a series of very violent struggles occurred with the anterior legs extended laterally; these efforts proved effectual, for then at 11.35 p.m. the expected moment came, when the skin suddenly burst all round the throat, as it seemed then to be, close to the old head-piece.

Immediately there appeared a transverse yawning rent, exposing the whitish head and tender glistening bases of the short first pair of legs, held back at the moment by their sheathing of old skin, which drew quickly from off them, when they fell forward in their natural position; the same measured heaving to and fro movement continuing with incessant energy as the old skin (rapidly blackening) drew back and next exposed the basal joints of the second or longest pair of legs, whose long femurs were soon uncovered, yet before their tibiae were freed the third pair of legs being a little shorter and of unequal lengths, were drawn out from their sheathing and slipped forward, first one, the shorter of the two, then the other, and next were liberated the tibiae and tarsi of the long second pair, all playing immediately after in unison with the whole body which now unbending sustained its hold of the twig by one ventral leg only of the fourth or hind pair, and while the old skin glided backwards by degrees the other ventral legs were in turn slowly stepping out as it were of their old stockings, at this time the long front crustacean-like legs began impatiently to play about and push at the old head-piece as cleverly as arms and hands, to weaken the attachment and free the mouth parts, and from them the old helmet fell away just as the second pair of ventral legs were uncovered.

Meanwhile the hinder segments of the body had become drawn out straight and narrowly cylindrical though tapering, the caudal filaments drawn close together forming apparently but one projecting point which now with the hinder portions of the body became elevated almost perpendicularly, as the fore parts with the head and anterior legs were lowered in contact with the mouth of the bottle, evidently feeling for the leaf which had been previously cut away as before mentioned, the third pair of ventral legs were next uncovered and then one of the fourth pair, when as the moment approached for the only supporting leg to let go its tenacious hold of the twig, I instantly held a silk handkerchief round the neck of the bottle just as the leg was removed and the old skin drawn back from it, and then the larva lay sprawling and trembling on the mouth of the bottle as the shrivelling skin drew off from the eleventh segment, and after a few efforts to hold itself on the bottle slipped off upon the soft surrounding material, whereon for two minutes it remained perfectly still, and made the first pause from incessant motion established so long; refreshed with this it then turned partly round and vigorously thrust and pushed with its mouth and arm-like legs at the old collapsed skin on the twelfth segment which soon became freed excepting the caudal filaments hidden within the retreating skin: now it lay at full length with the hinder segments slightly turned aside, all the ventral legs sprawling, the anterior ones extended forward in freedom, motionless, sleeping apparently for fourteen minutes, and then vibrated the front legs a little, slowly turning the head round, threw out the longest pair of arm-like legs beyond the head, one bent partly over the other like a tired out athlete enjoying repose in

perfect abandonment; for there seemed something very human in the expressively weary attitudes assumed while it again stretched itself with a slight change of position and slept for four minutes more; it then awoke and shook the tail segments which yet remained comparatively narrow, when suddenly the exuviae fell away disclosing the two perfect filaments; thus at 12.50 a.m. was this moult completed, having from the rupture of the skin to this final riddance occupied one hour and a quarter.—WILLIAM BUCKLER, Emsworth: *May 5th*, 1880.

Insects in Japan.—It is very evident I shall have little time for correspondence as spring comes on, and summer follows, as I have been almost entirely engaged in collecting and setting this month, although the greater part of it has been a series of storms of rain or snow. I have already got much material, but nothing grand yet. I found *Panagæus rubripes* and *Leistus laticollis*, which were wanting to my cabinet before, and I have about 7 new *Geodephaga*, all obscure species. From Hakodate, I have 4 or 5 others, and *Cychrus convexus*, given to me by a Japanese, so I have no doubt the *Cychrus* is common up there. I have made arrangements to be taken in at Hakodate on the 1st July, for 2 months. *Sympiezocera* is out here now and feeds in rotten *Cryptomeria japonica*. The *Hemiptera* are evidently abundant, as I have carded about 60 species and seen others. *Carabi* are not out yet; I have only seen 2 specimens—1 *insulicola* and the common species. *Damaster* should be about now, I hear, but it requires search at night and is troublesome to get.

Japan is disappointing in many ways, one cannot eat the food of the natives and this involves taking "chow-chow" with you everywhere, a great impediment and expense for portage. I have a passport for the 13 adjacent provinces and can go anywhere I like, but the idea of exhausting the Nipou-fauna must be abandoned—the country teems with species in every quarter—and it is too much for one person.

About 13 species of hybernated butterflies are seen in the warm parts of sunny valleys, and I shall get a few later.

Fusiyama must be seen to be appreciated; no wonder the Japanese pray to it. I am going up on to the plains on which its base rests, about the 15th of next month, for some early spring things and then again in June.

Nikko is the great place every one says for beauty, insects and primeval forests, it is 90 miles north of Tokio (no one speaks of Yedo now): we go to Nikko in June for 2 weeks before going to Yezo.

Rosalia Batesi, Har., is common here, in Yezo and Sikoke, and so is distributed evidently. Yokohama is the worst place in Japan for an Entomologist, you cannot get away from it under 4 or 5 miles, and then you find yourself close to some beach or other, no road takes you comfortably inland amongst moist woods and vegetation.

I was working at old pine "stools," as Turner called them, all yesterday with a heavy hatchet.

The *Elaters* are already just under the bark and will come out with the first burst of spring.

There are numbers (in species) of *Trichoptera* about, but they require too delicate handling to admit of preservation.

About 10 days ago I got some nice things at Mionoshta, a place in the hills 30

miles off. You can put your hand into the hill-side amongst the ferns and shrubs, and burn your fingers in the scalding water, or look down and see steam in jets mingling with the water-falls: the baths there are much frequented.—GEO. LEWIS, Grand Hotel, Yokohama: *March 27th*, 1880.

Note on Coniopteryx lutea, Wallengren.—This little-known species was described by Wallengren in his *Skandinavien Neuroptera*, pt. i, p. 55 (1871). It possesses ample posterior-wings, and is thus allied to *tineiformis* and *aleyrodiformis*, but it especially differs in the neurulation of the anterior-wings, the second sector being absolutely simple, whereas the first ends in two forks; moreover, there is a transverse nervule from near the beginning of the first sector to the second, and it is also larger, and the mealiness is described as yellowish-grey. He says two examples from Gothland are in the Stockholm Museum.

I have before me two examples of *Coniopteryx* that agree perfectly with the description, excepting that the mealiness can scarcely be termed yellowish; it is possible the original examples may have been discoloured by age. One of these is from Knusamo in East Bothnia, Finland; the other from Hautaika, district of the Yenesei (68°. 5 N.), North-western Siberia. Both taken by Dr. J. Sahlberg. They are larger than even *C. psociformis*. The antennæ are 24-jointed (Wallengren says *about* 25-jointed). This is evidently a boreal species, but there is no reason why it should not be found in Scotland.—R. McLACHLAN, Lewisham, London: *15th May*, 1880.

Elipsocus cyanops, Rostock, a species new to Britain.—Mr. J. E. Fletcher recently forwarded to me an example of this insect, one of three beaten by him from *Pinus sylvestris*, at the Old Hills near Worcester on August 13th, 1877, and June 10th, 1878. The species was described by Rostock, firstly in the *Entomologische Nachrichten*, vol. ii, p. 192 (1876), and secondly in the *Jahresb. Ver. Naturk. Zwickau*, for 1877, p. 99, from examples taken in Saxony. It is somewhat smaller than *E. Westwoodi* and *E. hyalinus*, and readily distinguishable by the body being wholly yellow, excepting the black (bluish in life, according to Rostock) eyes and ocelli, the antennæ (excepting at the base) and the tibiæ and tarsi being more obscure. The wings are wholly hyaline with dark neurulation and a yellowish pterostigma. It is most likely to be mistaken for *Cecilius obsoletus*, but the 3-jointed tarsi at once distinguish it therefrom, the intermediate joint being apparently longer and more distinct than in *E. Westwoodi* and its ally.

Probably it is the insect that Hagen identified somewhat doubtfully with *Heimerobius flavicans*, Linné, *Fauna Suecica*, ed. ii, p. 384. No doubt *flavicans* represents some species of *Psocidæ*, but it cannot have been *cyanops* from the words "*Caput nigrum. Thorax nigricans*" (in the diagnosis the words are "*niger, thorace abdomineque flavis*"). I have types of *E. cyanops* before me.

There is yet work to be done in British *Psocidæ*, notwithstanding that most of the known European species have been detected here.—ID.

Corrections of Errors.—In my note on "*Parthenogenesis in Tenthredinidæ*," &c., vol. xvi, 269, two errors of nomenclature occur. For "*Nematus miliaris*" read "*Nematus curtispina*, Thoms.," and for "*Nematus pallidus*" read "*Nematus palliatus*, Thoms."—J. E. FLETCHER, Worcester: *May 14th*, 1880.

ON *MUSCA HORTORUM*, FALLÉN, AND ALLIED SPECIES.

BY R. H. MEADE.

It has been well said, that an Entomologist who aspires to be anything more than a collector or dabbler in science, must confine himself to the study of one Order of insects; and if he has but little time at his disposal, devote most of his attention to one family in that Order: he can only thus acquire an intimate and critical acquaintance with the characters of the species which it contains, or of their life history.

In many genera there are small groups in which the species bear such a close general resemblance to each other, that several species have been confounded together by the older authors. This has principally arisen from their neglecting to observe and record minute points of structure, such as the number and disposition of the hairs and spines on the legs, wings, or body of the insect; which are often exceedingly valuable specific characters, being mostly constant, and not liable to vary like size and colour.

The descriptions of the older Entomologists were also generally so brief, that they often apply equally well to two or three distinct species, and there is very little doubt that they frequently were so applied; the author confusing two or three species. Much learning has sometimes been brought to bear on this subject, in the endeavour to ascertain the precise species to which a name has been applied; but if this point can be cleared up at all, it must be by the examination of typical specimens preserved in Museums.*

It is to one small group in the restricted family of *Muscidæ* that I wish to direct attention. In our gardens and groves, and on the road-side hedges, a very common fly may be found of a blue-black colour, marked with white reflections, rather larger than the ordinary house fly (*Musca domestica*), which has been long known as the garden fly (*Musca hortorum*). Upon careful examination it will be found that two distinct species (both common in most places in England), have been confounded by all the older Dipterologists, and are still but imperfectly known, different authors who have distinguished them having described them by different names, in ignorance of the writings of others; so that the synonymy is in great confusion.

Robineau-Desvoidy, in his great work upon the Myodaires, published in 1830, first pointed out that there were several distinct species

* Meigen's collection of *Diptera* is in the Jardin des Plantes, in Paris; Macquart's in the Museum of his native city, Lille; Fallén's is in Stockholm.

in this group, and he made a new genus for their reception, which he named *Morellia*; he failed, however, to characterize the different species satisfactorily, and it was our own countryman Haliday who, retaining R. Desvoidy's generic name *Morellia*, first clearly separated the two common species which had been previously confounded. His account will be found in the Entomological Magazine for 1836. Macquart had previously (in 1833) described a well-marked smaller species in his "Diptères du nord de la France," which he named *curvipes*;* and he also noticed that there was another resembling *M. hortorum*, but he only noticed slight differences in colour, and copied R. Desvoidy's descriptions, which were too vague to be of any value. Dr. H. Loew fully described both the common species as well as another in 1857, and Professor Rondani also gave an account of them in 1862; but none of the authors I have mentioned agree as to the names which they give to the two common species, nor which of them should retain Fallén's original name. Walker, in the "Insecta Britannica," ignored Haliday's paper, only giving one species; and, as the descriptions of the latter author in the Entomological Magazine are very brief, and not now generally accessible, I hope it may not be without interest if I endeavour to describe the four species now included in R. Desvoidy's genus, and try to clear up the synonymy.

The larvæ of the two common species have been found in cowdung.

Genus MORELLIA, R. Desv.

Eyes naked, arista plumose, fourth longitudinal vein of wing bent outwards towards the third, in a rounded curve, so as nearly to close the first posterior cell, which terminates a little before the apex of the wing; posterior or discal transverse vein placed midway between the anterior or little cross vein and the centre of the curve of the fourth longitudinal vein. Shining blue-black flies, striped and tessellated with black and white, with the antennæ, palpi, and legs black. The species in this genus are coloured and marked in a very similar manner to *Aricia albo-lineata* (one of the *Anthomyiidae*), with which they must not be confused.

The species may be thus distinguished:

- A. Hind metatarsi with a cushion of short stiff hairs on their under surfaces, but not bearded, and hind tibiæ straight, or only slightly curved.
- B. Middle tibiæ without a basal tubercle in the males.
- C. Hind tibiæ straight, fore tibiæ simple.

Sp. 1—SIMPLEX, Loew.

* This species has not been recorded as British, though it is not uncommon in England.

CC. Hind tibiæ of males slightly curved, fore tibiæ ciliated.

Sp. 2—*HORTORUM*, Fallén.

BB. Middle tibiæ of males with a bristly tubercle at the base.

Sp. 3—*PODAGRICA*, Loew.

AA. Hind metatarsi of males with a thick beard in addition to the cushion, and with hind tibiæ much curved.

Sp. 4—*CURVIPES*, Macquart.

1. *SIMPLEX*, LW. ♂ ♀. *Cæculo-chalybea nitida*; thorax antice vittis tribus latis albidis; abdomen tessellis albidis, linea dorsali, maculisque indeterminatis nigricantibus; ♂ oculis sub-coherentibus, tibiis posticis subrectis, intus medio longe ciliatis; tibiis anticis intus nudis; alulæ, squamis inferioribus infumatis; alæ hyalinæ, venis longitudinalibus tertiis, basi setulosis (♂ ♀); ♀ oculis quartario capitis separatis; pedibus simplicibus; alulis albidis. Long. $2\frac{1}{2}$ — $3\frac{1}{2}$ lin.

SYN.—*Musca hortorum*?, Meigen, System. Besch., v, 73. *Cyrtoneura hortorum*?, Macq., Diptères du nord de la France, 148, and Ins. Dipt., ii, 276. *Cyrtoneura hortorum*, Rondani, Dipt. Ital., v, 213. *C. simplex*, Loew, Wiener entom. Monatschr., i, 45; Schiner, Fauna Austr., i, 596. *Morellia hortorum*, R. Desv., Dipt. des environs des Paris, ii, 636; Haliday, Entom. Mag., iv, 149. *M. importuna*, Haliday, Ann. of Nat. Hist., ii, 185.

Colour dark glossy black-blue: head black; ♂, eyes separated by a narrow black space contracted in the middle, where the eyes are almost contiguous. ♀, eyes separated by a space measuring one-fourth of the width of the head; ♂ ♀, sides of face glistening silvery-white, with black reflections; antennæ not quite reaching epistome, third joint twice the length of second, of a grey colour; arista thinly furnished with long hairs, which leave the apex bare for some length; palpi black, epistome slightly prominent, setigerous; facial groove bordered with bristles; cheeks clothed with short black hairs: thorax with three longitudinal, broad, glistening white stripes, most distinct on the front margin; the lateral stripes irregular in shape, and only extending backwards as far as the base of the wings; between the white stripes are two indistinct black ones on each side: abdomen of a glistening greyish-blue colour, sometimes with a glaucous tinge; it has a longitudinal black dorsal stripe, and is tessellated with black and white spots or rather reflections, which show differently when viewed in different aspects: legs with fore femora clothed in ♂ with soft short hairs along their outer sides, and ciliated in ♂ ♀, beneath with long stiff bristles of nearly equal length, placed at equal distances from each other like the teeth of a comb; fore tibiæ naked on their inner sides, and having only a row of short even hairs on their outer and under surfaces; middle femora with a few long stiff bristles on their upper sides near the tip, and with some long hairs on the under surfaces near the base; middle tibiæ evenly ciliated along their outer sides with a row of very short hairs; hind femora clothed along their exterior and under surfaces with long hairs, something similar to those under

Musca chloropt. Lundu. 1881. H. 1941
 the fore femora; hind tibiæ nearly straight, slightly thickened in the middle, beset with bristles of unequal lengths on their outer sides, having a few long hairs on the lower half of their under surfaces in ♂ and ♀, and also a few long soft hairs on their inner sides, just below the middle in ♂; hind tarsi with a cushion of short stiff bristles of a brownish-yellow colour on their under surfaces: alulets with the upper or smaller valves half white and half grey, and the lower and larger ones of an uniform smoky-brown colour in ♂, with a yellowish marginal fringe, and dirty white in ♀: halteres yellow: wings clear, with black veins; third longitudinal vein with a small tuft of bristles at its base in ♂ and ♀, some of which extend a short distance towards the small cross vein.

This species is generally distributed throughout Europe; it is less common than the next in most parts of England and Ireland (Haliday), and also in Germany, but more general in Italy and probably in France.

It is very difficult to decide to which species to apply Fallén's original name, as modern authors differ so much on this point. Haliday, whose opinion is worthy of every respect, changed his mind upon the subject. In his original paper in the Entomological Magazine, in which he first pointed out the distinctive characters between this and the following species, he named the one I have first described *hortorum*; but in the second volume of the Annals he said that he was mistaken, and believed that the next species which he had before named *importuna* was the true *hortorum* of Fallén. I have already said that I have no doubt whatever that Fallén, Meigen, Zetterstedt,* and others, confused two species together, so that it matters little which of the two retains the original name; I have therefore concluded to follow Loew, the greatest modern authority on Dipterology, who gives the name of *hortorum* to that species which appears to be most common in the north of Europe.

2. *HORTORUM*, Fall. ♂ ♀. *Glauco-chalybea nitida*. Thorax et abdomen ut in *M. simplice signata*; ♂ oculis paulo distantibus; femoribus anticis subtus extraque barbatis; tibiis anticis extra spinosis intusque villosis; femoribus mediis apice cristatis; tibiis posticis leviter curvatis, intus breviter villosis; alulis sordide albidis; alis, venis longitudinalibus tertiis, setis parvis armatis, ordine positiss, inter basem venæ et venam transversam parvam. ♀ oculis tertia parti capitis separatis; pedibus simplicibus.

Long. 3—4½ lin.

SYN.—*Musca hortorum*, Fallén, Act. Holm. (1816), 252, 33, et

* Zetterstedt, in Dipt. Scand., describes his *Cyrtoneura hortorum* as having the eyes in ♂ "coherentes (non vero arctissimi)," et "tibiæ omnes rectæ"—both these characters apply to *M. simplex*; but he adds, "squamæ albæ," et "femora antica extus in ♂ villosa"—both of which apply to *M. hortorum*.

Dipt. Suec. Muscid., 52, 33 ; Wiedemann, Zool. Mag. (1817), i, 183 ; ? Meigen, System. Besch., v, 73 ; Zetterstedt, Insect. Lappon., 660 ; Walker, Insect. Brit., ii, 113. *Cyrtoneura hortorum*, Zetterstedt, Dipt. Scand., iv, 1346 ; Loew, Wien. ent. Mon., i, 46 ; Schiner, Faun. Austr., 1, 596. *C. pilipes*, Rondani, Dipt. Ital., v, 215. *Morellia importuna*, Haliday, Ent. Mag., iv, 149. *M. hortorum*, Haliday, Ann. Nat. Hist., ii, 185. *M. agilis*?, R. Desv., Myod., 405. *Alina agilis*, R. Desv., Dipt. envir. de Paris, ii, 639.

Colour and pattern the same as in *M. simplex*, but the abdomen has more frequently a green tinge: head—eyes of ♂ parted by a black space, which occupies about one-eighth of the width of the head, and is about twice as wide as the interval between the eyes of *M. simplex*; the space between the eyes of ♀ measures one-third of the width of the head, characters of the other parts of the head similar to those of *M. simplex*: thorax and abdomen marked as in *M. simplex*: legs with fore femora ciliated beneath with long stiff hairs, in addition to which (in the ♂) they are thickly bearded on the outer and under sides with soft hairs; fore tibiæ of ♂ with a few long stiff spines on their outer surfaces near the middle and at the extremities, and with their inner sides clothed along the whole length with thick, soft, and rather short hairs; middle femora armed in ♂ with a tuft of short but stiff bristles near the tip; middle tibiæ with a series of short erect little spines, placed irregularly along the upper half of the outer surface, and having the lower half of the same surface fringed with soft short hairs, as in *M. simplex*; hind femora with only a few long hairs on their under surfaces near the ends; hind tibiæ slightly but distinctly curved inwards at their lower thirds, they have a thick row of short stiff bristles along their outer sides, and only a few short soft hairs on their inner and under surfaces; hind tarsi as in *M. simplex*: alulets dirty white, lower scale in ♂ having a brown tinge in the form of a ring, near the margin, the edge itself being fringed with pale yellow: wings clouded near the base with brown, which colour is conspicuous in the small basal cells: third longitudinal vein armed with six or seven small spines, which are arranged along the vein at nearly equal distances, and extend from the base to near the small cross vein in ♂ and ♀.

This species is rather larger than the former, and very common; the males may at once be distinguished from those of the preceding species by the tuft on the apex of the middle femora, by the wider space between the eyes, and by the anterior tibiæ being hairy on their inner sides instead of the posterior ones, as in *M. simplex*; also by the spines on the wings. The females of the two species (which authors have failed to discriminate) may most readily be known from each other by the difference in width between the eyes, by the hind tibiæ in *M. simplex* being clothed beneath with a few long hairs (which are absent in *M. hortorum*), and by the different armature of the third longitudinal veins of the wings.

3. PODAGRICA, LW. ♂. *Nigro-chalybea nitida, lineata et irrorata*

ut in *M. simplice*; *oculis sub-contiguïs*; *pedibus anticis ut in M. simplice armatis*; *tibiis intermediis tuberculo hirsuto basi posito*; *tibiis posticis paulo curvatis, et extra ciliatis*; *alis subfuscis*; *alulis obscuris*.
Long. 4—5 lin.

SYN.—*Cyrtoneura podagrica*, Loew, Wien. ent. Mon., i, 45; Schiner, Dipt. Austr., i, 596.

♂. Colour shining dark blue-black, without any tinge of green: thorax and abdomen marked as in the two preceding species, but having the latter less tessellated with white: head as in *M. simplex*, the eyes near together, though not contiguous: legs, fore femora ciliated with a comb-like row of bristles on their under surfaces, as in *M. simplex*; fore tibiæ nearly bare; middle legs armed as in *M. hortorum*, and also with a bristly tubercle seated on the outer side of the head of the tibia; hind tibiæ a little curved, clothed with long soft hairs on their outer sides: alulets with the lower scale of an uniform brownish-yellow colour: wings tinged with brown at their bases and along the fore borders, the longitudinal veins also a little clouded; the third longitudinal vein armed at the base with a few spines, as in *M. simplex*: the ♀ is unknown to me.

This fly has not yet been found in Britain, but inhabits lofty mountains in Germany, where it is said to be not uncommon. It is the largest species in the genus, and is of rather a darker colour than the others; I have not seen a female, but my friend Mr. Kowarz, of Franzensbad, kindly sent me a male specimen.

4. *CURVIPES*, Macq. *Cærulco-nigra nitida*; *thorace albo-lineato et abdomine cinereo-tessellato*; *♂ tibiis posticis valde arcuatis*; *metatarsisque posticis barbatis*; *femoribus intermediis subtus in basi spinula erecta armatis*; *tibiisque intermediis inclinatis*. *Long. 2½—3 lines.*

SYN.—*Curtoneura curripes*, Macq., Dipt. du Nord., 148, et Insect. Dipt., ii, 276. *Cyrtoneura curripes*, Zett., Dipt. Scand., iii, 1347; Rond., Dipt. Ital., v, 215. *Camilla ænescens*, R. Desv., Dipt. envir. de Paris, ii, 641.

This species varies a good deal in colour, it is less brilliant and less distinctly striped and tessellated than either of the preceding ones, though marked in the same manner; there is often a greyish, and sometimes an æneous tinge on the abdomen, and the thorax is less blue than black; the ♂ has the eyes somewhat widely separated; the fore femora are ciliated beneath as in *M. simplex*; the fore tibiæ simple; middle femora armed beneath at their bases with a single long strong spine, and with a few long bristles on their outer and under surfaces near their apices; the middle tibiæ have an angular bend in the middle, the lower halves being directed outwards, they are also ciliated along their whole outer surfaces with little stiff rough spines, similar to those seen in *M. hortorum* and *M. podagrica*; the hind femora are evenly clothed along their whole under surfaces with hairs of a moderate length, and have a tuft on their upper surfaces near the base; the hind tibiæ are rather long and strongly curved inwards; they are bare on their inner sides, with

the exception of two long, slender, curved bristles on each tibia near the apex; the outer surfaces are armed with spines of uneven lengths; the hind metatarsi, in addition to the usual cushions, have beards of strong, long, black hairs on their under surfaces, partially extending to the other joints of the tarsi: alulets nearly white: wings in some specimens tinged at the base and along the fore border with brown, in others clear; the third longitudinal vein is armed with a few little spines arranged in a row, as in *M. hortorum*: the ♀ is not known to me.

This well-marked little species is not uncommon in England, though rather local; I have received specimens from Mr. B. Cooke, of Southport, and have found the males plentifully near Bicester in Oxfordshire; I have not yet met with the female. Macquart and R. Desvoidy say that it is common in France; Rondani has found it frequently in Italy; Zetterstedt says that it is very rare in Scandinavia; and its capture has not yet been recorded in Germany, to my knowledge.

Bradford, Yorks :
May, 1880.

NATURAL HISTORY OF *BOTYS PANDALIS*.

BY WILLIAM BUCKLER.

Hitherto the early stages of this species have remained in profound obscurity, and now that I have become familiar with them I can understand why the larva, from its mode of life, had never been detected; therefore, my pleasure is all the greater in being able to render an account of it, which I owe to the discernment and kindness of my friend Mr. W. R. Jeffrey, of Ashford, who, on the 13th of June, 1879, captured a female *pandalis*, and with hope of obtaining eggs confined her in a jam-pot, together with leaves of several *Compositæ* and *Labiatae*, yet not an egg was deposited on any of them.

However, two days later Mr. Jeffrey found several eggs had been laid on the inside smooth surface of the pot and five more on its piece of plate-glass cover, looking for all the world like splashes of moisture that should be wiped off at once, but the next moment with keen intuition he knew they were *ova*; and though wishing to send some directly to me, he afterwards very wisely resolved not to risk forwarding the piece of glass, but to pay attention to them and their produce himself, till they were fit to travel, and to furnish me with his observations, which here follow.

“When first laid on 14th and 15th June the eggs were flat, scale-like, but more translucent than any I have observed, like minute drops of fluid or oil; under the microscope the shell is seen to be reticulated

Eupæcilia notulana, Z. Along with the last species Dr. Wood sent me some larvæ of this, from which I took the following description :—

Smooth, stout, nearly cylindrical, but with the segments slightly swollen in front, inactive, naked, pale yellowish-green, greener when young, dorsal vessel visibly brownish, spots indistinct, grey. Head and divided dorsal plate shining black, anal segment and plate very pale brown.

Feeding in October in stems of *Mentha hirsuta*, apparently entering at a joint and working upwards, feeding on the pith, and leaving the lower part of the burrow tightly packed with excrement. Hibernating within the stem, and generally spinning up therein, but occasionally deserting it to spin elsewhere. Pupa light brown, in a cocoon formed of white silk and frass, forcing itself out before the moth emerges in June.

Lord Walsingham found larvæ of this species feeding in the same manner in stems of *Lycopus europæus* at Wicken Fen. The moth in this case emerged in July.

Eupæcilia ciliella, Hüb. Through the kindness of my old friend Mr. Sang, I have been enabled to secure a description of the larva of this species, which I append, as it differs slightly from those already published :—

Plump, sluggish, shining, shortly tapering at the anal extremity, white, with hardly visible spots, naked, except a few hairs towards the hinder end, head and dorsal plate shining jet-black, anal plate very small, pale brown, on the back of the ninth segment is a distinct reddish-brown internal blotch. When full-grown it becomes tinged with pink.

Feeding in August on the seeds of the cowslip (*Primula veris*), leaving the seed vessels, when full-grown, and spinning up in hollow sticks or dead stems, where it hibernates, assuming the pupa state in the spring. Pupa light brown, with darker brown wing-sheaths, protruding from the cocoon before the moth emerges—in June.

Argyrolepis zephyrana, Tr. Larva one-third of an inch in length, broadest at the second and third segments, and tapering to the anal extremity, with segments deeply divided and ridged, yellow, spots barely visible, hairs minute, head rather broad, pale brownish, with a brown line in front of each eye enclosing the mouth, which is dark brown, plates shining pale yellow. In the autumn and winter, in the stems of *Daucus carota*, eating out the pith and filling the space with frass, still feeding in the dead stems, or working back through the frass, as late as April, and spinning a very slight brownish cocoon in the tightly packed mass of frass in the stem. Pupa very pale yellowish-brown, extruded from the stem, and often falling out when the moth emerges—in June.

For the opportunity of describing this and the following species, I am indebted to a kind friend who collected them for me in Cambridgeshire.

Lozopera Francillana, Fab.

Larva short, plump, cylindrical, dirty yellowish-white, head black, dorsal plate faintly brown, with two dark brown spots at the posterior edge, anal plate small, faintly brownish with a dark spot in the middle.

Feeding in the autumn and until April in the stems of *Daucus carota*, eating the pith and filling the space with frass, through which it seems to work back in the spring. It appears also to make small cocoon-like chambers in the frass, and then abandon them, but ultimately spins up in the stem and becomes a light brown pupa, which pushes itself through the bark of the stem when the moth emerges: this takes place in July and August.

My remark in vol. xi, p. 196, that the larva had been reared from seeds of *Daucus carota* seems to have been a mistake. At the same time I quoted from M. Jourdheuille's Calendar: "Larva in dead stems of *Eryngium campestre*," and remarked that this must refer to another species. A short while ago, M. Ragonot sent me four beautiful specimens of *flagellana*, Dup. (giving *eryngiana*, Heyd., as a synonym), telling me that they were reared from dead stems of *Eryngium campestre*. These specimens differ from *Francillana* in being less glossy and of a more ochreous yellow, and in having the first oblique fascia abbreviated and slightly clubbed at the apex, with a spot opposite it on the costa, while the second fascia is more curved, attenuated in the middle, and often has a short row of dots outside it. This species seems constant in its markings, and is intermediate between *Francillana* and *Smeathmanniana*.

Heinemann (p. 80) gives *flagellana*, H.-S., as synonymous with *Francillana*, Fab., and Wocke includes *flagellana*, Dup., as well as *flagellana*, H.-S., under *Francillana*, Fab., but he gives *eryngiana*, Heyd., as a distinct species. I have no opportunity now of ascertaining whether Duponchel's and Herrich-Schäffer's *flagellana* are the same species, but I think there can be no doubt that *flagellana*, Dup., should be separated from *Francillana*, F., as a distinct species, with *eryngiana*, Heyd., as a synonym.

Pembroke: 16th June, 1880.

Stigmonota scopariana, a *Tortrix* new to our list.—This very handsome species I bred the last week in April and first week in May. I had no idea of my prize, in fact, at first I thought they were only very big *Lithocolletis ulmifoliella* until I chloroformed one and then saw it was a *Tortrix* which at the time I set down as *Coccyx splendidulana*, until I took them to Preston to compare, and at once saw I had a puzzler. I sent one to Mr. Stainton, who did not know it, then I sent it on to Mr. C. G. Barrett, he wrote me what he thought it was, but wanted to see both sexes; I then sent him both sexes, and he at once wrote me they were *Stigmonota scopariana*. I imagined the larvæ had been obtained from mountain ash, but the name *scopariana* at once made me think whether I had ever been among broom, as it is scarce at Dutton; there are some broom bushes about 50 yards from my house which I beat only once and put any larva in along with those I beat among mountain ash, &c., so most likely the pabulum of this gem is the broom. I bred six specimens in all.—J. B. HODGKINSON, 15, Spring Bank, Preston: June 13th, 1880.

R. H. Meade.

*Few remarks up. certain
Dipterous Insects.*

1880.

host of the "Five Miles from Anywhere," who has for many years been used to the eccentricities of entomologists, and who can tell them where to work for many species. Whichever way is chosen, it is well to write first to see if a bed can be obtained, for the visitor must not expect to find a "grand hotel" with an unlimited number of apartments near Wicken Fen.

Royal Aquarium, Westminster, July, 1880.

The Entomologist. London. Vol. XIII. No. 207. 1880.
In Lib. Z. Dept

A FEW REMARKS UPON CERTAIN DIPTEROUS INSECTS.

BY R. H. MEADE.

Nov. 1881.

HAVING spent a few days towards the latter end of last June in Buckinghamshire and the neighbouring parts of Oxfordshire, I am induced to make a few remarks upon some interesting Dipterons which I noticed in those localities. This order is so extensive that I shall confine my observations almost exclusively to the members of one family, the *Anthomyiidae*, which are very interesting, though they have received but little attention.

The first species to which I shall allude is *Ophyra anthrax*, Mgn. On a hawthorn hedge by the side of the road, on the outskirts of the town of Buckingham, I found this little blue-black fly in immense numbers. Some years ago I noticed it before in the same place, but I have never seen it in any other locality, though I have looked for it in various parts of England. Nearly opposite to the hedge in question, on the other side of the road, there is a bone-mill, in which bones are ground up for manure; and I noticed that a very strong putrescent odour emanated from it. This smell evidently attracted the flies, for they were most numerous on that end of the hedge which was nearest to the mill. This peculiar species seemed to have almost exclusive possession of the locality, for, with the exception of a very few individuals belonging to the larger species of the same genus (*Ophyra leucostoma*, Fall.), I noticed no other flies among them. On referring to the accounts given of this species by systematic authors I found, in Schiner's 'Fauna Austriaca' (Diptera), the remark that it is of local occurrence, and that he once found it in countless numbers ("in wahrer Unzahl") near a dead horse. What is the source of attraction? Do the larvæ feed upon

carrion? The flies I saw were almost all of the male sex; out of fifty which I captured only two or three were females.

After leaving Buckingham I stayed for several days in a retired country parsonage within the borders of Oxfordshire, and I found the garden, shrubbery, and immediately surrounding country very rich in rare and interesting species of Anthomyiidae. A dry enumeration of the names of those which I captured would be of little interest, so I will only mention those which are particularly rare, or peculiar in their habits.

Under a large standard apple tree in the kitchen garden I noticed, on a sunny day following a wet morning, a number of *Homalomyias* performing a joyous aerial dance, such as all the flies belonging to this genus are fond of doing. Upon watching them I observed that they were of three distinct kinds and sizes; some were small and grey in colour, others rather larger and blacker; and, darting between these, and glistening in the stray beams of sunshine which stole through the leaves of the tree, were a few individuals of a still larger size and brighter colour sporting with the rest. I captured one or two of each kind with my forceps, and found them to be *H. canicularis*, Lin., *H. scalaris*, Mgn., and *H. aprica*, Hal. The two former are common everywhere indoors and out, but the last, which is the largest species in the genus, must be considered rather rare, though it is widely distributed. The interest here attaches to the circumstance that three distinct species were sporting and associating together. Is this usual? As I believe is always the case, the flies performing this dance were all males.

Pyezura pardalina.—On a shrub in the garden I captured a rare Dipteron closely allied to the *Homalomyias*, but placed in a separate genus by its discoverer, Prof. Rondani, who named it *P. pardalina*. It differs from the *Homalomyias* by having a plumose instead of a bare arista on the antennæ. This little fly has hitherto only been recorded as a native of Italy, not being mentioned in any of the works I have seen on the Diptera of France, Germany, or Scandinavia, as well as England. I am sorry to say I only found a single male specimen, though I carefully searched for others.

Hytodesia (Aricia) abdominalis, Zett., and *Hydrostæa velutina*, Desv.—I will only mention these two other Anthomyids, both of which I found. Both are rare; the former is recorded by Walker as British, but I had not previously seen it; the latter has not been

found before in England to my knowledge, and is very rare on the Continent.

In conclusion, the only fly belonging to another family to which I shall allude is the *Morellia* (*Cyrtoncra*) *curripes*, Macq. I had formerly captured several males of this rather rare Muscid in the same neighbourhood, but on the present occasion I found numbers of both males and females (the latter I had not previously seen) on the leaves of strawberry plants in the garden.

Bradford, Yorks, July, 1880.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By J. B. BRIDGMAN AND E. A. FITCH.

No. II.—ICHNEUMONIDÆ (*continued*).

SECTION 5.—Scutellum and abdomen black; apex reddish or fulvous.

Tarsi and tibiæ yellow (B) or saffron (A), apex of hind one black.

A. Intermediate segments of abdomen rufo-fulvous at the sides.

122. *dubitatus*, 6 lines.

B. Intermediate segments not so marked.

111. *ancipiterus*, 6—6½ lines.

SECTION 6.—Scutellum pale; abdomen red and black; apex with white or whitish marks.⁽¹⁾

A. Middle area of post-petiole aciculate; supero-medial area of metathorax rectangular or subquadrate (females).

Subdivision I.—Antennæ filiform or the apex slightly attenuated; rather stout, after death involuted; mesothorax a little higher than the metathorax.

Scutellum white or yellowish.

a. Hind coxæ pubescent beneath.

* 2nd and 3rd segments either entirely red, red and black, or sometimes quite black; tibiæ, especially the hinder ones, reddish at the base; femora black. 30. *computatorius*, 6—9 lines (a).

** 2nd and 3rd segments, the latter with a black basal band and hinder femur, red; apex black, and tibiæ the same.

32. *vaginatorius*, 5—6 lines.

*** 2nd and 3rd segments red; hinder tibiæ with a wide straw-coloured band in the middle. 31. *confusorius*, 5—7 lines (a).

b. Hind coxæ not pubescent beneath; greater part of the femora black, especially the hinder ones.

(1) Generally it is the last two or three segments that are pale marked, sometimes the last four, and sometimes only the last: these marks often vary in the same species

- † Margins of cheeks descending more or less below the base of the mandibles; 2nd and 3rd segments of abdomen red.
- † Tarsi and tibiæ red; apex of hinder one black.
- § Scutellum white. - - - 35. *bucculentus*, 6—9 lines (a).
- §§ Scutellum whitish yellow. - - - 37. *gracilentus*, 5—6 lines.
- †† Tibiæ whitish straw, apex of front one red-brown, apex of hind one black. - - - 36. *suspiciosus*, 6—9 lines (a).
- †† Margins of cheeks not dilated below the base of the mandibles. 2nd and 3rd abdominal segments red.
- × Hind tibiæ in the middle straw or whitish straw-coloured.
- * 3rd segment with a short black basal band. 38. *terminatorius*, 6—9 lines.
- ** 3rd segment with the black band; this and the 2nd, chestnut marked with black, or entirely black. 39. *melanotis*, 7—8 lines (a).
- × × Hind tibiæ red or reddish straw-coloured at the base.
- * 1st to 3rd abdominal segments red. - 46. *multipictus*, 3 lines.
- ** 2nd and 3rd segments red, 4th sometimes partly so. 42. *luctatorius*, 6—8 lines.
- × × × Hind tibiæ black. - - - 43. *militaris*, nearly 4 lines.

Subdivision II.—Antennæ setaceous, after death incurved or subinvolved, apex distinctly attenuated; mesothorax and scutellum generally much higher than the metathorax; hinder coxæ not pubescent beneath; 2nd and 3rd abdominal segments red, the 3rd in both sexes generally transverse.

- a. Scutellum yellowish or white.
- * Gastrocæli of 2nd segment of the abdomen rather large, the space between them equal to the width, or only a trifle wider than the middle area of the post-petiole.
- † Femora black.
- † Spot on coxæ and base of tibiæ yellowish, especially the hinder one. 48. *primatorius*, 10—11 lines.
- †† Tibiæ red, apex of hinder one and coxæ black. 53. *formosus*, 5½ lines.
- †† Greater part of femora red.
- § Hind knees black. - - - 50. *gracilicornis*, 4—5½ lines (a).
- §§ Hind knees not black.
- × Middle area of metathorax subquadrate. 52. *quadrialbatus*, 4—5 lines.
- × × Middle area of metathorax wider than long. 49. *bellipes*, 7½ lines.
- ** Gastrocæli of the 2nd segment smaller, the space between them wide, mostly wider than the middle area of the post-petiole.
- + 2nd and 3rd abdominal segments red.
- o Tibiæ red, yellow in the middle. 54. *caloselus*, 5—6 lines (a).
- oo Tibiæ red, apex of hinder one black.
- ++ From the base of 2nd segment to the apex of the 5th the sides are parallel. - - - 56. *subcylindricus*, 6 lines.
- ++++ Abdomen not thus narrowed in the middle.
- ∞ Upper margin of the collar sordid white. 55. *cædutor*, 4—4½ lines.

ON *MUSCA HORTORUM*, FALLÉN, AND ALLIED SPECIES.

BY R. H. MEADE.

It has been well said, that an Entomologist who aspires to be anything more than a collector or dabbler in science, must confine himself to the study of one Order of insects; and if he has but little time at his disposal, devote most of his attention to one family in that Order: he can only thus acquire an intimate and critical acquaintance with the characters of the species which it contains, or of their life history.

In many genera there are small groups in which the species bear such a close general resemblance to each other, that several species have been confounded together by the older authors. This has principally arisen from their neglecting to observe and record minute points of structure, such as the number and disposition of the hairs and spines on the legs, wings, or body of the insect; which are often exceedingly valuable specific characters, being mostly constant, and not liable to vary like size and colour.

The descriptions of the older Entomologists were also generally so brief, that they often apply equally well to two or three distinct species, and there is very little doubt that they frequently were so applied; the author confusing two or three species. Much learning has sometimes been brought to bear on this subject, in the endeavour to ascertain the precise species to which a name has been applied; but if this point can be cleared up at all, it must be by the examination of typical specimens preserved in Museums.*

It is to one small group in the restricted family of *Muscidae* that I wish to direct attention. In our gardens and groves, and on the road-side hedges, a very common fly may be found of a blue-black colour, marked with white reflections, rather larger than the ordinary house fly (*Musca domestica*), which has been long known as the garden fly (*Musca hortorum*). Upon careful examination it will be found that two distinct species (both common in most places in England), have been confounded by all the older Dipterologists, and are still but imperfectly known, different authors who have distinguished them having described them by different names, in ignorance of the writings of others; so that the synonymy is in great confusion.

Robineau-Desvoidy, in his great work upon the *Myodaires*, published in 1830, first pointed out that there were several distinct species

* Meigen's collection of *Diptera* is in the Jardin des Plantes, in Paris; Macquart's in the Museum of his native city, Lille; Fallén's is in Stockholm.

in this group, and he made a new genus for their reception, which he named *Morellia*; he failed, however, to characterize the different species satisfactorily, and it was our own countryman Haliday who, retaining R. Desvoidy's generic name *Morellia*, first clearly separated the two common species which had been previously confounded. His account will be found in the Entomological Magazine for 1836. Macquart had previously (in 1833) described a well-marked smaller species in his "Diptères du nord de la France," which he named *curvipes*;* and he also noticed that there was another resembling *M. hortorum*, but he only noticed slight differences in colour, and copied R. Desvoidy's descriptions, which were too vague to be of any value. Dr. H. Loew fully described both the common species as well as another in 1857, and Professor Rondani also gave an account of them in 1862; but none of the authors I have mentioned agree as to the names which they give to the two common species, nor which of them should retain Fallén's original name. Walker, in the "Insecta Britannica," ignored Haliday's paper, only giving one species; and, as the descriptions of the latter author in the Entomological Magazine are very brief, and not now generally accessible, I hope it may not be without interest if I endeavour to describe the four species now included in R. Desvoidy's genus, and try to clear up the synonymy.

The larvæ of the two common species have been found in cowdung.

Genus MORELLIA, R. Desv.

Eyes naked, arista plumose, fourth longitudinal vein of wing bent outwards towards the third, in a rounded curve, so as nearly to close the first posterior cell, which terminates a little before the apex of the wing; posterior or discal transverse vein placed midway between the anterior or little cross vein and the centre of the curve of the fourth longitudinal vein. Shining blue-black flies, striped and tessellated with black and white, with the antennæ, palpi, and legs black. The species in this genus are coloured and marked in a very similar manner to *Aricia albo-lineata* (one of the *Anthomyiidae*), with which they must not be confused.

The species may be thus distinguished:

- A. Hind metatarsi with a cushion of short stiff hairs on their under surfaces, but not bearded, and hind tibiæ straight, or only slightly curved.
- B. Middle tibiæ without a basal tubercle in the males.
- C. Hind tibiæ straight, fore tibiæ simple.

Sp. 1—SIMPLEX, Loew.

* This species has not been recorded as British, though it is not uncommon in England.

CC. Hind tibiae of males slightly curved, fore tibiae ciliated

Sp. 2 —*HORTORUM*, Fallén.

BB. Middle tibiae of males with a bristly tubercle at the base.

Sp. 3 —*PODAGRICA*, Loew.

AA. Hind metatarsi of males with a thick beard in addition to the cushion, and with hind tibiae much curved.

Sp. 4 —*CURVIPES*, Macquart.

1. *SIMPLEX*, Lw. ♂ ♀. *Ceruleo-chalybea nitida*: thorax antice vittis tribus latis albidis; abdomen tessellis albidis, linea dorsali, maculisque indeterminatis nigricantibus; ♂ oculis sub-coherentibus, tibiis posticis subrectis, intus medio longe ciliatis; tibiis anticis intus nudis; alulae, squamis inferioribus infumatis; alae hyalinae, venis longitudinalibus tertiis, basi setulosis (♂ ♀); ♀ oculis quartario capitis separatis; pedibus simplicibus; alulis albidis. Long. $2\frac{1}{3}$ — $3\frac{1}{2}$ lin.

SYN.—*Musca hortorum*?, Meigen, System. Besch., v, 73. *Curtoneura hortorum*?, Macq., Diptères du nord de la France, 148, and Ins. Dipt., ii, 276. *Cyrtoneura hortorum*, Rondani. Dipt. Ital., v, 213. *C. simplex*, Loew, Wiener entom. Monatschr., i, 45; Schiner, Fauna Austr., i, 596. *Morellia hortorum*, R. Desv., Dipt. des environs des Paris, ii, 636; Haliday, Entom. Mag., iv, 149. *M. importuna*, Haliday, Ann. of Nat. Hist., ii, 185.

Colour dark glossy black-blue: head black; ♂, eyes separated by a narrow black space contracted in the middle, where the eyes are almost contiguous. ♀, eyes separated by a space measuring one-fourth of the width of the head; ♂ ♀, sides of face glistening silvery-white, with black reflections; antennae not quite reaching epistome, third joint twice the length of second, of a grey colour; arista thinly furnished with long hairs, which leave the apex bare for some length; palpi black, epistome slightly prominent, setigerous; facial groove bordered with bristles; cheeks clothed with short black hairs: thorax with three longitudinal, broad, glistening white stripes, most distinct on the front margin; the lateral stripes irregular in shape, and only extending backwards as far as the base of the wings; between the white stripes are two indistinct black ones on each side: abdomen of a glistening greyish-blue colour, sometimes with a glaucous tinge; it has a longitudinal black dorsal stripe, and is tessellated with black and white spots or rather reflections, which show differently when viewed in different aspects: legs with fore femora clothed in ♂ with soft short hairs along their outer sides, and ciliated in ♂ ♀, beneath with long stiff bristles of nearly equal length, placed at equal distances from each other like the teeth of a comb; fore tibiae naked on their inner sides, and having only a row of short even hairs on their outer and under surfaces; middle femora with a few long stiff bristles on their upper sides near the tip, and with some long hairs on the under surfaces near the base; middle tibiae evenly ciliated along their outer sides with a row of very short hairs; hind femora clothed along their exterior and under surfaces with long hairs, something similar to those under

the fore femora ; hind tibiæ nearly straight, slightly thickened in the middle, beset with bristles of unequal lengths on their outer sides, having a few long hairs on the lower half of their under surfaces in ♂ and ♀, and also a few long soft hairs on their inner sides, just below the middle in ♂ ; hind tarsi with a cushion of short stiff bristles of a brownish-yellow colour on their under surfaces : alulets with the upper or smaller valves half white and half grey, and the lower and larger ones of an uniform smoky-brown colour in ♂, with a yellowish marginal fringe, and dirty white in ♀ : halteres yellow : wings clear, with black veins ; third longitudinal vein with a small tuft of bristles at its base in ♂ and ♀, some of which extend a short distance towards the small cross vein.

This species is generally distributed throughout Europe ; it is less common than the next in most parts of England and Ireland (Haliday), and also in Germany, but more general in Italy and probably in France.

It is very difficult to decide to which species to apply Fallén's original name, as modern authors differ so much on this point. Haliday, whose opinion is worthy of every respect, changed his mind upon the subject. In his original paper in the Entomological Magazine, in which he first pointed out the distinctive characters between this and the following species, he named the one I have first described *hortorum* ; but in the second volume of the Annals he said that he was mistaken, and believed that the next species which he had before named *importuna* was the true *hortorum* of Fallén. I have already said that I have no doubt whatever that Fallén, Meigen, Zetterstedt,* and others, confused two species together, so that it matters little which of the two retains the original name ; I have therefore concluded to follow Loew, the greatest modern authority on Dipterology, who gives the name of *hortorum* to that species which appears to be most common in the north of Europe.

2. HORTORUM, Fall. ♂ ♀. *Glauco-chalybea nitida*. Thorax et abdomen ut in *M. simplice signata* ; ♂ oculis paulo distantibus ; femoribus anticis subtus extraque barbatis ; tibiis anticis extra spinosis intusque villosis ; femoribus mediis apice cristatis ; tibiis posticis leviter curvatis, intus breviter villosis ; alulis sordide albidis ; alis, venis longitudinalibus tertiis, setis parvis armatis, ordine positis, inter basem venæ et venam transversam parvam. ♀ oculis tertio parti capitis separatis ; pedibus simplicibus. Long. 3—4½ lin.

SYN.—*Musca hortorum*, Fallén, Act. Holm. (1816), 252, 33, et

* Zetterstedt, in Dipt. Scand., describes his *Cyrtoneura hortorum* as having the eyes in ♂ "coherentes (non vero arctissimi)," et "tibiæ omnes rectæ"—both these characters apply to *M. simplex* ; but he adds, "squamæ albæ," et "femora antica extus in ♂ villosa"—both of which apply to *M. hortorum*.

Dipt. Suec. Muscid., 52, 33 ; Wiedemann, Zool. Mag. (1817), i, 183 ; ? Meigen, System. Besch., v, 73 ; Zetterstedt, Insect. Lappon., 660 ; Walker, Insect. Brit., ii, 113. *Cyrtoneura hortorum*, Zetterstedt, Dipt. Scand., iv, 1346 ; Loew, Wien. ent. Mon., i, 46 ; Schiner, Faun. Austr., 1, 596. *C. pilipes*, Rondani, Dipt. Ital., v, 215. *Morellia importuna*, Haliday, Ent. Mag., iv, 149. *M. hortorum*, Haliday, Ann. Nat. Hist., ii, 185. *M. agilis*?, R. Desv., Myod., 405. *Alina agilis*, R. Desv., Dipt. envir. de Paris, ii, 639.

Colour and pattern the same as in *M. simplex*, but the abdomen has more frequently a green tinge: head—eyes of ♂ parted by a black space, which occupies about one-eighth of the width of the head, and is about twice as wide as the interval between the eyes of *M. simplex*; the space between the eyes of ♀ measures one-third of the width of the head, characters of the other parts of the head similar to those of *M. simplex*: thorax and abdomen marked as in *M. simplex*: legs with fore femora ciliated beneath with long stiff hairs, in addition to which (in the ♂) they are thickly bearded on the outer and under sides with soft hairs; fore tibiae of ♂ with a few long stiff spines on their outer surfaces near the middle and at the extremities, and with their inner sides clothed along the whole length with thick, soft, and rather short hairs; middle femora armed in ♂ with a tuft of short but stiff bristles near the tip; middle tibiae with a series of short erect little spines, placed irregularly along the upper half of the outer surface, and having the lower half of the same surface fringed with soft short hairs, as in *M. simplex*; hind femora with only a few long hairs on their under surfaces near the ends; hind tibiae slightly but distinctly curved inwards at their lower thirds, they have a thick row of short stiff bristles along their outer sides, and only a few short soft hairs on their inner and under surfaces; hind tarsi as in *M. simplex*: alulets dirty white, lower scale in ♂ having a brown tinge in the form of a ring, near the margin, the edge itself being fringed with pale yellow: wings clouded near the base with brown, which colour is conspicuous in the small basal cells: third longitudinal vein armed with six or seven small spines, which are arranged along the vein at nearly equal distances, and extend from the base to near the small cross vein in ♂ and ♀.

This species is rather larger than the former, and very common; the males may at once be distinguished from those of the preceding species by the tuft on the apex of the middle femora, by the wider space between the eyes, and by the anterior tibiae being hairy on their inner sides instead of the posterior ones, as in *M. simplex*; also by the spines on the wings. The females of the two species (which authors have failed to discriminate) may most readily be known from each other by the difference in width between the eyes, by the hind tibiae in *M. simplex* being clothed beneath with a few long hairs (which are absent in *M. hortorum*), and by the different armature of the third longitudinal veins of the wings.

3. PODAGRICA, LW. ♂. *Nigro-chalybea nitida, lineata et irrorata*

ut in *M. simplice* ; *oculis sub-contiguis* ; *pedibus anticis ut in M. simplice armatis* ; *tibiis intermediis tuberculo hirsuto basi posito* ; *tibiis posticis paulo curvatis, et extra ciliatis* ; *alulis obscuris*.
Long. 4—5 lin.

SYN.—*Cyrtoneura podagrica*, Loew, Wien. ent. Mon., i, 45; Schiner, Dipt. Austr., i, 596.

♂. Colour shining dark blue-black, without any tinge of green : thorax and abdomen marked as in the two preceding species, but having the latter less tessellated with white : head as in *M. simplex*, the eyes near together, though not contiguous : legs, fore femora ciliated with a comb-like row of bristles on their under surfaces, as in *M. simplex* ; fore tibiae nearly bare ; middle legs armed as in *M. hortorum*, and also with a bristly tubercle seated on the outer side of the head of the tibia ; hind tibiae a little curved, clothed with long soft hairs on their outer sides : alulets with the lower scale of an uniform brownish-yellow colour : wings tinged with brown at their bases and along the fore borders, the longitudinal veins also a little clouded ; the third longitudinal vein armed at the base with a few spines, as in *M. simplex* : the ♀ is unknown to me.

This fly has not yet been found in Britain, but inhabits lofty mountains in Germany, where it is said to be not uncommon. It is the largest species in the genus, and is of rather a darker colour than the others ; I have not seen a female, but my friend Mr. Kowarz, of Franzensbad, kindly sent me a male specimen.

4. CURVIPES, Macq. *Ceruleo-nigra nitida* ; *thorace albo-lineato et abdomine cinereo-tessellato* ; *♂ tibiis posticis valde arcuatis* ; *metatarsisque posticis barbatis* ; *femoribus intermediis subtus in basi spinula erecta armatis* ; *tibiisque intermediis inclinatis*. *Long. 2½—3 lines.*

SYN.—*Cyrtoneura curvipes*, Macq., Dipt. du Nord., 148, et Insect. Dipt., ii, 276. *Cyrtoneura curvipes*, Zett., Dipt. Scand., iii, 1347 ; Rond., Dipt. Ital., v, 215. *Camilla ænescens*, R. Desv., Dipt. envir. de Paris, ii, 641.

This species varies a good deal in colour, it is less brilliant and less distinctly striped and tessellated than either of the preceding ones, though marked in the same manner ; there is often a greyish, and sometimes an aeneous tinge on the abdomen, and the thorax is less blue than black ; the ♂ has the eyes somewhat widely separated ; the fore femora are ciliated beneath as in *M. simplex* ; the fore tibiae simple ; middle femora armed beneath at their bases with a single long strong spine, and with a few long bristles on their outer and under surfaces near their apices ; the middle tibiae have an angular bend in the middle, the lower halves being directed outwards, they are also ciliated along their whole outer surfaces with little stiff rough spines, similar to those seen in *M. hortorum* and *M. podagrica* ; the hind femora are evenly clothed along their whole under surfaces with hairs of a moderate length, and have a tuft on their upper surfaces near the base ; the hind tibiae are rather long and strongly curved inwards ; they are bare on their inner sides, with

the exception of two long, slender, curved bristles on each tibia near the apex ; the outer surfaces are armed with spines of uneven lengths ; the hind metatarsi, in addition to the usual cushions, have beards of strong, long, black hairs on their under surfaces, partially extending to the other joints of the tarsi : alulets nearly white : wings in some specimens tinged at the base and along the fore border with brown, in others clear ; the third longitudinal vein is armed with a few little spines arranged in a row, as in *M. hortorum* : the ♀ is not known to me.

This well-marked little species is not uncommon in England, though rather local ; I have received specimens from Mr. B. Cooke, of Southport, and have found the males plentifully near Bicester in Oxfordshire ; I have not yet met with the female. Macquart and R. Desvoidy say that it is common in France ; Rondani has found it frequently in Italy ; Zetterstedt says that it is very rare in Scandinavia ; and its capture has not yet been recorded in Germany, to my knowledge.

Bradford, Yorks :

May, 1880.

1^o. H. Meade,

Notes of Diptera. (Meas.)

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2<sup>o</sup>. E. Inghuld.

*Dipterous Plant Miners, etc.*

1881.



concluding that blue flowers were formerly yellow or white? Let us consider some of the orders in which blue flowers occur with others of different colours.

For instance, in the Ranunculaceæ,\* those with simple open flowers, such as the buttercups and *Thalidiums*, are generally yellow or white. The blue *Delphiniums* and *Aconites* are highly specialized, abnormal forms, and doubtless, therefore, of more recent origin. Among the Caryophyllaceæ the red and purplish species are amongst those with highly specialized flowers, such as *Dianthus* and *Saponaria*, while the simple open flowers, which more nearly represent the ancestral type, such as *Stellaria*, *Cerastium*, &c., are yellow and white. I cannot, therefore, concur with Hildebrand in considering that red was the original colour of the family.”

*In litt. to the author Dec. 1/1 1882.*

The author then proceeded further to discuss the subject of the colours of flowers, and concluded by saying:—

“However this may be, it seems to me that the preceding experiments show conclusively that bees do prefer one colour to another, and that blue is distinctly their favourite.”

Sir John Lubbock then made some most interesting remarks upon the Identification of Companions in Ants, on the Recognition of Relations, Peculiarities of Manner, Longevity, and on the genus *Anergates* of the same group of insects, to which subjects we shall on a future occasion refer.

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## NOTES ON DIPTERA.

By R. H. MEADE, F.R.C.S.

DIPTEROUS insects, being mostly small in size and sombre in colour, will never excite much interest in the imago or perfect form; but the naturalist who will take up the study of their preliminary states, and endeavour to make out their life-history, will be rewarded for his trouble by the interest he will find in the pursuit. Many species mine the leaves of plants, and the leaves so affected may be easily known either by the blotches or blisters which the larvæ of the larger flies (*Anthomyiidae* and *Trypetidae*) produce, as they separate the two layers of the leaf from each other by eating the cellular succulent tissue between them, or by the tortuous lines which show the course of the mines made by

\* I take most of the following facts from Müller's admirable work on Alpine Flowers.

the larvæ of the small mining Diptera (*Phytomyzidæ*, &c.). If these leaves are gathered while the larvæ are at work, and kept in a moist place,—as a wide-mouthed bottle with some damp earth at the bottom, or in a glass-topped box,—the gatherer will in time be rewarded by the emergence of the imago, which is often of great beauty, as the *Trypeta Zoë*, which mines the leaves of the ragwort and groundsel, or the *Acidia heraclei*, which blotches those of the garden celery. Most of these flies are double-brooded, and the leaves gathered in the beginning of summer will produce the perfect insects in about a month, while from those collected in the autumn or latter part of summer no flies must be expected to emerge until the following spring.

My friend Mr. Inchbald is quite an enthusiast in this department, and I have been enabled to clear up the life-history of several interesting species by means of his investigations.

It is not to the subject of mining Diptera, however, that I now seek to direct especial attention, but to another tribe of equal interest,—that of parasites; those flies, for instance, which pass the first and most important stage of their existence in eating the bodies of other insects, especially of Lepidoptera, whose larvæ they destroy, and thus perform a very useful work in Nature, though one not always appreciated by the collector.

The parasitic class of insects is a very large one, and a great part of it consists of Hymenoptera. I am glad to say that this division has lately received much attention, especially at the hands of Messrs. Fitch and Bridgman. The dipterous parasites, on the contrary, are very little known; and the family of the *Tachinidæ* is the most difficult one to study in the whole order of Diptera. A large number of these flies have been described and named, but very few have been traced to their origin. If lepidopterists would carefully preserve all that they breed from the pupæ of moths or butterflies, and note the species from which each one emerged, the life-history of this interesting family might soon be rescued from its present obscurity. I will gladly endeavour to name any specimens so bred, if they are forwarded to me.

With the exception of a list of European *Tachinidæ* and their feeders, arranged side by side, which was compiled by the late Francis Walker, and published in the 'Cistula Entomologica'

(pars X., September, 1874), no systematic attempts have, I believe, been made to arrange the different species of parasite, together with those of their victims; and at present the amount of information on the subject is too small to enable me to place them in any order. A good many facts have been recorded by R. Desvoidy, Macquart, Zetterstedt, Schiner, Rondani, and others; and I will endeavour to add my mite to the stock of information on the subject by recording those facts that have fallen under my own observation.

The parasitic Diptera do not all belong to the *Tachinidæ*, though this may be named the family of parasites "par excellence." Some of the little flies belonging to the genus *Phora* have been bred from the pupæ of other insects, but not much is known about them. Two instances of this kind have fallen under my own observation, viz., in December, 1880, I received a specimen of *Phora minor*? Zett., from Mr. Fitch, which he had bred from the larva of a sawfly (*Nematus salicis*); and a few days since Mr. C. Waterhouse sent me one of *Phora rufipes*, Meig., bred from *Nematus ribesii*.

Some of the *Sarcophagæ*, or flesh flies, have been bred from the larvæ of other insects. I was much interested by receiving several specimens of *Sarcophaga lineata*, Fallen, in September last, from Sir Sidney Smith Saunders, which had been bred from the locusts (*E. cruciata*) in the Troad, and to which they were said to have been very destructive. A closely allied species (*S. affinis*, Fall.) has been reared from two or three species of *Tinea*. The larvæ of the flesh flies mostly live upon dead animal substances; and Schiner\* thinks it doubtful whether they are ever true parasites, but only feed upon the larvæ or pupæ of insects which have died from other causes. Should this surmise be correct, will it not apply also to the larvæ of the *Phoræ*, which have been found in other larvæ?, for these little flies are mostly reared from decaying vegetable and animal (?) matters. In the United States Professor Riley found the larvæ of *Anthomyia angustifrons*, Meig., very destructive to the locust eggs, while *Tachina anonyma*, Riley, and *Sarcophaga sarraceniæ*, Riley, were parasitic on the locusts themselves.

Lastly, with respect to anomalous parasites, I may mention that Mr. Bridgman lately sent me three female specimens of the

\* 'Fauna Austriaca' (Diptera), vol. i. p. 568.



common *Dilophus vulgaris* (*Bibionidæ*), together with their pupa-cases, which had been bred, as he informed me, by Mr. F. Norgate from larvæ of *Catoptria hypericana*. The *Dilophi* have always been supposed to be vegetable feeders, the larvæ eating the roots of grass, &c. They often swarm in great numbers in the autumn, and I need not say that this is not the habit of the parasitic flies, which though numerous as species are scarce as individuals. I think there must have been some mistake in the matter, but record the observation to stimulate further researches.

I will now conclude my remarks by giving a list of those Tachinids whose origin is known to me. It will be seen that some prey upon a number of different larvæ, while others appear always to attack the same species. I shall follow no arrangement, but commence with the most common parasite.

EXORISTA VULGARIS, Fallen.

I have received specimens of this fly from several correspondents, whom I will mention in alphabetical order, giving the names of the insects from which they were bred.

Mr. Bignell, of Stonehouse, sent me specimens bred from *Tæniocampa stabilis*, *Polia flavocincta*, *Notodonta camolina*, *Hybernia defoliaria*, *Vanessa urticae*, *Tortrix ribeana*, *Abraxas grossulariata*, and *Eubolia cervinaria*.

Mr. Bridgman, from *Sphinx ligustri*.

Mr. Fitch, from *Simyra venosa*, *Phlogophora meticulosa*, and *Zygæna filipendulæ*.

Mr. Fletcher, of Worcester, from *Pieris rapæ* and *Abraxas grossulariata*.

Mr. Mosley, of Huddersfield, from *Odonestis potatoria* and *Anthocharis cardamines*.

Mr. Porritt, of Huddersfield, from *Odonestis potatoria*.

This ubiquitous parasite varies so much in size, colour, and even in structure, that several varieties have been made by R. Desvoidy and Macquart into distinct species; most of these are, doubtless, only varieties of one species, but I believe that two or three distinct ones have been confounded together, though I have not yet been able to separate them by any really distinctive characters.

EXORISTA GRANDIS, Zett.

This fine species has been bred from *Saturnia carpini* by Mr. Bignell, Mr. Fitch, Mr. Mosley and Mr. Sang.

## EXORISTA HORTULANA, Meigen.

I have received this species from Mr. Bridgman and also from Mr. Porritt, by both of whom it was bred from *Acronycta alni*.

## EXORISTA AFFINIS, Fallen.

Mr. Bridgman sent me specimens of this species bred, together with the last, from *Acronycta alni*; and I have also received it from Mr. Fitch, who reared it from a larva of the same species. It appeared such a remarkable circumstance that two distinct but closely-allied parasites should be bred at the same time from the same larvæ that I was led to examine them very carefully, and suspect that the flies which I have severally named *E. hortulana* and *E. affinis* are only varieties of the same species, which is probably new, as it does not exactly agree with the descriptions given of either of the above species.

## EXORISTA LOTA, Meig.

Mr. Dale sent me specimens bred from *Tæniocampa stabilis*; and Mr. Fletcher one from *Acronycta psi*.

## EXORISTA PARENS, Rondani.

I have received this species from Mr. Bignell, bred from *Polia flavocincta*.

## NEMOREA NOTABILIS, Meig.

Mr. B. Cooke gave me a specimen of this species, bred from *Botys verticalis*; and I have received another from Mr. Porritt, reared from the larva of the same species.

## PHOROCERA CONCINNATA, Meig.

Mr. Fletcher has bred this fly from *Acronycta aceris*.

## TACHINA LARVARUM, Linn.

This large parasite has been bred by Mr. Bignell from *Zygæna filipendulæ*.

## BAUMHAUERIA VERTIGINOSA, Meig.

Mr. Fitch has bred this from the larva of *Chelonia caja*.

## SCOPOLIA OCYPTERINA, Zett.

Mr. Butler sent me this species, reared from *Pterophorus tephradactylus*.

## THELAIRA LEUCOZONA, Panzer.

This parasite—which is placed in the family of the *Dexiidae* instead of the *Tachinidae*, in consequence of its having a plumose arista—has been bred by Mr. Butler from *Chelonia caja*.

Bradford, Yorkshire, October, 26, 1881.

## DIPTEROUS PLANT-MINERS IN THEIR PERFECT STATE.

BY PETER INCHBALD, F.L.S.

IN a paper on the subject of plant-miners, which I communicated to this magazine last autumn (Entom. xiv. 41), I spoke of the *earlier* stages of these plant-mining Diptera,—their larva and pupa state,—together with their habits of life and phases of development. This year I have been fairly successful in rearing the imagines, and I gladly place my observations, such as they are, in the hands of those of your readers who may be interested in our mining Diptera. I must mention at the very outset that I have had the privilege of the diagnoses of Dr. Meade, of Bradford, in the identification of most of those species that I have happened to rear; diagnosis in species so closely allied is in many cases very difficult. My very best thanks are due to him, as are those of our dipterists generally, for the patience and perseverance he has shown in his discriminations. As in my previous paper I will give the various classes of plants, and the Diptera that affect them.

RANUNCULACEÆ.—*Ranunculus repens* yielded me, though scantily, *Phytomyza flava*, Fallen. It is a pretty little fly, and very lively in its movements. The pupa from which it emerged is shining bottle-green in colour. The imagines began to appear on the 10th of July. Dr. Meade remarks that *P. flava* was the name given to it by Fallen in 1823. Goureau and Desvoidy have since described it under the name *Ranunculi*, a better name, perhaps, if the insect should prove an exclusive feeder on *Ranunculus*. Fallen seems to have known nothing of the food-plant. The leaves of the columbine of our gardens showed extensive mining in the autumn of 1880. Sometimes two mines occupied one leaf. They pupated within the glass-topped box, the pupa being of a shining amber-colour. The imagines appeared in the spring of 1881, and proved to be the *Phytomyza anchole* of Goureau and Desvoidy, which is identical with the *Phytomyza obscurella* of Fallen. I bred fully a dozen of this fly in May of the present year.

UMBELLIFERÆ.—*Phytomyza albiceps*, the feeder on *Heracleum*, I find bestows his attentions on various *Compositæ*, as well as *Umbellifereæ*. I have bred this fly from ivy-leaved lettuce (*Lactuca*

*muralis*), as also from dandelion and nipplewort (*Lapsana*). It is probably, therefore, the most polyphagous of the group. This bears out the remarks of Scholtz and Hardy, who find the fly mining such various vegetation. Fully a dozen distinct plants afford food to *P. albiceps*, according to their observations. Another beautiful fly is *Trypeta onopordinis*, which mines our celery leaves, often damaging the crop, though not so seriously as to interfere with its growth. It was first described by Linnaeus, in his 'Fauna Suecica,' in 1771; he found it mining the leaves of *Heracleum*. It is now called *Acidia heraclei*, L. The affected celery leaves were gathered on the 17th of July, and the imagines emerged from pupahood on the 17th of August.

CRUCIFERÆ.—Though not a miner, but a root-feeder, I would draw attention to a fly, *Chortophila floccosa*, Macquart, which is destructive in the larva state to our young savoys. The plants that were affected died from the loss of their rootlets. I bred both male and female. The tufts of hairs on the posterior thighs serve to identify the species. Dr. Meade remarks that nothing of its life-history in connection with its food-plant has been previously recorded.

LABIATÆ.—I succeeded this year, for the first time, in rearing the gall-gnat of the ground-ivy. It is instrumental in forming those reddish purse-like galls on the leaf of the ground-ivy. I gathered the galls in the autumn of 1880, and the imago put in an appearance on the 28th of the May following. The structure of the gall itself is as marvellous as it is mysterious. The opening of the cone-shaped purse is on the under side of the leaf, and in this purse the larva lives, feeds, and pupates, putting on wings, as I have said, in the following May. The name of the gall-gnat is *Cecidomyia bursaria*, Bremi.

CHENOPODIACÆ.—Here, again, we find probably the whole family mined by *Chortophila betæ*, Curtis, the pest of our mangold fields. I have bred the identical fly from Chenopod-spinach, mangold and beet this year, and this is possibly not surprising, as the juices and mucilage of the group would doubtless make it generally available for culinary purposes, like the spinach. I hear, indeed, of a sea-coast Chenopod (*Schoberia maritima*) furnishing food to *C. betæ* on the Sussex coast. Thus it is more than probable that the fly may adapt itself to circumstances in obedience to the season and its food-supply.

POLYGONACEÆ.—I have bred in tolerable abundance the miners of the sorrel and dock. From the sorrel, *Pegomyia nigritarsis*, Zett., and *Chortophila transversalis*, Zett. The former species, says Dr. Meade, has been confounded with *P. fulgens*, Meigen; but Rondani says they are distinct, the true *P. fulgens* having a yellow scutellum. It is somewhat doubtful whether the continental *P. fulgens* has been seen in Britain. From the dock (*Rumex obtusifolius*), *Pegomyia nigritarsis* of Zetterstedt, and *P. bicolor*, Wiedmann; very possibly, as Dr. Meade remarks, feeding within the same leaf. Robineau Desvoidy and Schiner both suspected the distinctness of the miners of the sorrel-dock. From the sorrel I bred largely; I had fifty pupæ, but all proved to belong to one species. I had ninety-six pupæ of the dock, and from these two species presented themselves.

AQUIFOLIACEÆ.—I had abundantly *Phytomyza aquifolii*, Walker, from blotched holly leaves. This insect—so common with us, as to blotch in some seasons nearly every leaf—is not mentioned by Schiner, Meigen, or Zetterstedt. I had a score at one time in my breeding box. It differs, says Dr. Meade, from *P. obscurella*, Fall., in the lower part of the face (untergesicht), being pale yellow. In *P. obscurella* it is dusky; moreover the venation of the wings is different.

COMPOSITÆ.—From the blotches of the burdock leaves I hatched, early in May, both male and female flies of *Chortophila conformis*, Fallen. Dr. Meade informs me that the male was previously unknown; and remarks further that it closely resembles the *C. rimans* of Rondani, according to the description which he gives of the female of that species, of which he did not know the male. Another Composite, the groundsel, yielded me, in fair abundance, the beautiful *Spilographa Zoë*, Meig., which Bremi bred also from groundsel. It is one of the *Trypetidæ*, whose lively, fanning, movements I so much admire. The larva of this fly feeds within the leaves of the groundsel, usually near the midrib. The pupa is pale yellow. I reared plenty, both of the male and female.

Fulwith Grange, Harrogate, October 24, 1881.

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THE GENUS *PHÆDON*.

BY THE REV. W. W. FOWLER, M.A., F.L.S.

As there seems to be so much misunderstanding about the different species of the genus *Phædon*, it may perhaps be useful to say a few words concerning the group, especially as the subject has been lately discussed in the pages of the 'Entomologist.' Stephens places fourteen species in this genus, including in it our genera *Plagiodera*, *Prasocuris*, *Phratora*, *Phædon*, *Gastrophysa*, and one *Chrysomela*, viz. *fastuosa*. Of all these none, except *Plagiodera*, have any affinity to the *Phædons* proper. It might seem, indeed, at first sight, that *Plagiodera armoraciæ* was a real *Phædon*; it is, however, generally distinguished by the ventral segments of the abdomen, and by its much flatter and less convex appearance. It is decidedly a rare insect, and I have not heard of its being taken since Mr. G. C. Champion found it a few years ago. It is said to be found beneath the bark of willows, or at the roots of grass in marshy places; the latter habitat seems to agree better with the nature of the whole group, and very probably the willow bark only serves it as a refuge from weather, or as winter-quarters, as it is a very common thing to find allied species of the *Chrysomelidæ* under bark of trees in winter. We have, then, left, four species of *Phædon* proper, which may be treated of in order:—

*Phædon tumidulum*, Kirby.—This species, which has no synonyms, is easily distinguished by its thorax being distinctly punctured at the base only, the rest being smooth; it is of a dull dark blue or olive-green colour, and not very variable. It is exceedingly abundant in spring and summer on hedge-sides and ivy banks; in fact I have seldom swept any locality without coming across it somewhere or other. I never remember, though, to have found it on marshy, or even damp, ground.

*Phædon betulæ*.—Dr. Sharp, in his Catalogue, assigns this species to Linné, and gives the *P. betulæ* of Waterhouse's Catalogue as a synonym of *P. cochleariæ*; whereas in Waterhouse's Catalogue *Phædon armoraciæ*, Linné, *P. cochleariæ*, Fab., and *P. betulæ*, Suffr., are given as synonyms for one species; and *Phædon betulæ*, Linné, and *P. cochleariæ*, Suffr., are given as synonyms of another species. It is very probable that some

confusion has arisen at some time or other between *Plagioder a armoraciæ* and *Phædon armoraciæ*, which latter is plainly the insect that we are to understand by the *P. betulæ* of Dr. Sharp's Catalogue, as they are exceedingly alike at first sight, owing to their very prominent shoulders and general appearance. I think, then, that this *P. betulæ*, which stands next on our list to *P. tumidulum*, is Linné's *Chrysomela armoraciæ*, and not the insect he meant by *C. betulæ*. It is a very distinct species, and is easily distinguished from *P. tumidulum*, which it much resembles at first sight, by its thorax being distinctly punctured all over, and by its very prominent shoulders. I have always found it an uncommon insect, and have never taken it, or heard of its being taken, except in damp or marshy places.

*Phædon cochleariæ*.—This is usually considered to be the *Chrysomela cochleariæ* of Fabricius, although Mr. Waterhouse apparently considers Fabricius's insect to be synonymous with the preceding species. Thomson (Skand. Coleopt., viii. 273), assigns it to Fabricius, and his authority is of great weight. If Linné by his *C. betulæ* meant one of our *Phædons*, and not *Phratora vulgatissima* or some quite different insect, I am inclined to think that it is this species to which his name must be attached. This is the insect referred to in the 'Entomologist' for this present year by Mr. Hart (Entom. xiv. 187) and by Mr. Billups (Entom. xiv. 237). It is easily distinguished from the other species by the punctuation of its thorax, its less convex shape, and the peculiar brightness of its colour; it seems peculiar in that it appears to have no particular preference for either dry or marshy ground. Mr. Billups has shown how abundantly he has found it on a dry field; and I have taken it in company with the preceding species in a marshy place near Repton, and on cruciferous plants growing actually in the water near Lincoln. This species is perhaps the most injurious to man either of this or the allied genera, as it seems to attack useful plants to a greater degree than its congeners.

*Phædon concinnum*, Steph.—This species is distinguished from the preceding by its rather more convex shape, and by its being almost universally of a bright green colour, *P. cochleariæ* being nearly always blue; the interstices of the elytra in *P. concinnum* are coarsely punctured and wrinkled, whereas in *P. cochleariæ* they are only very finely wrinkled. I have not heard of this insect



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## ENTOMOLOGY FOR BEGINNERS.

### *THE SATELLITE SPHINX*—*Philampelus satellitia* Linn.

BY THE EDITOR.

This is one of the most beautiful of our Sphinx moths, a rare as well as lovely creature, and an object highly prized by collectors. It is found throughout the northern United States and occasionally in Canada, but is no where very common.

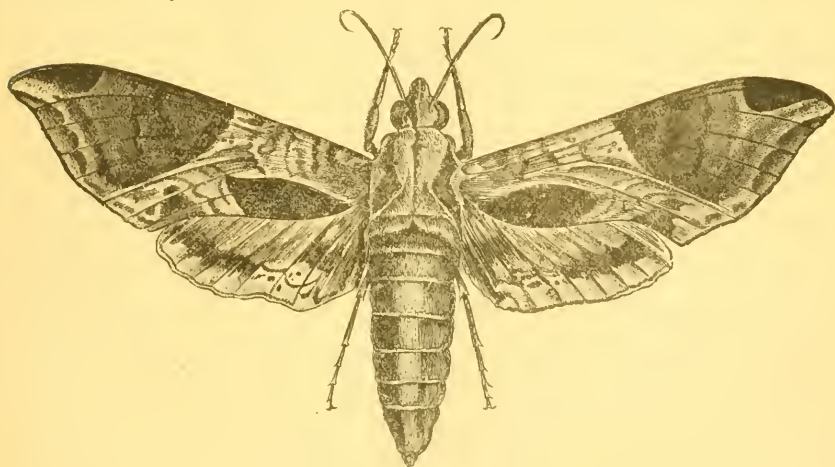


Fig. 4.

The moth (fig. 4), when its wings are expanded, will measure from four to four and a half inches across. Its color is of a light olive mixed with gray and varied with patches of a darker olive green, rich and velvety, and some portions with a rosy hue. The moths appear in July, when after pairing, the female deposits her eggs singly on the leaves of the grape-vine or Virginia creeper (*Ampelopsis quinquefolia*), where they shortly hatch into small green larvæ of a pinkish hue along the back and with a very long pink horn at the tail. As the caterpillar increases in size the tail becomes shorter, and after a while curves round as shown at

*c* in fig. 5. As the larva approaches maturity it changes to a reddish brown color, and after passing the third moult entirely loses the caudal horn, which is replaced by a glassy eye-like spot. The mature larva when in motion, as shown at *a*, fig. 5, will measure nearly four inches in length, but when at rest it draws the head and two adjoining segments within the fourth, as shown in the figure at *b*, which shortens its length nearly an

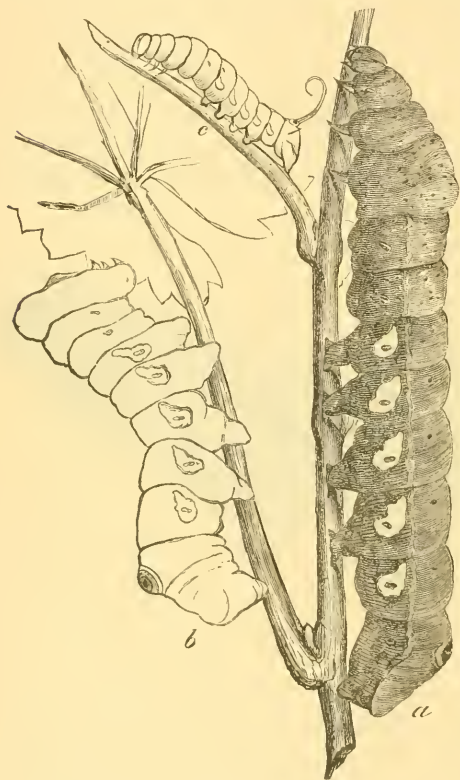


Fig. 5.

inch, giving it a very odd appearance with its anterior portions so blunt and thick. It is of a rich reddish brown color, of a lighter shade along the back, with five or six nearly oval cream-colored spots along each side from the fifth to the tenth segments inclusive; sometimes the spot on the fifth segment is indicated by a dot only, in other instances entirely wanting. On the anterior segments there are a number of black dots; a dark polished raised eye-like spot in place of the tail; stigmata black, showing prominently in the cream-colored spots along the sides.

It is a very voracious feeder, and where present strips the vine so rapidly of its leaves that it soon attracts attention. When full grown it descends and buries itself in the ground,

where it forms an oval cell within which it changes to a chrysalis.

The chrysalis is of a chestnut brown color with the segments roughened with impressed points, the terminal ring having a long thick spine. The insect usually remains in the chrysalis state until the following summer, but sometimes it hatches the same season. In the 9th vol. of the

CAN. ENT., p. 120, an instance of this sort is recorded by Mr. R. Bunker, of Rochester, where the larva became a chrysalis on the first of August and produced the moth on the 10th of September. Should these larvæ at any time prove troublesome, they can be readily subdued by hand-picking.

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LIST OF N. AMERICAN ANTHOMYIDÆ, EXAMINED BY  
R. H. MEADE, ESQ., BRADFORD, ENGLAND.

BY DR. H. A. HAGEN, CAMBRIDGE, MASS.

Mr. R. H. Meade has kindly examined the N. American Anthomyidæ of the Museum of Comparative Zoology in Cambridge, forwarded to him by the Baron von Osten Sacken. The collection was returned last year by the Baron to the Museum. The species are separated carefully and accompanied by a list giving the genera and species, the latter not named except when identical with European species. The notes and determinations of the list differ sometimes from the notes previously published by Mr. R. H. Meade in the Entom. Monthly Mag., 1878, xiv., p. 230-250. Those differences and the more complete statements in the list induced me to publish it, thinking it to be ungrateful to Mr. Meade that his extensive and thorough examination should rest in the archives of the Museum and be lost to science. Baron von Osten Sacken stated in his letter that he has not the intention to work out the Anthomyidæ. I have carefully compared the labeled types in the Loew collection, and have added always the locality for the species examined by Mr. Meade. Where I was able to make out identities, they are given. The collection of the Museum, out of which the Baron himself selected the lot sent to Mr. Meade, will probably contain only duplicates of the lot, except in later additions. Loew's collection contains a number not yet assorted and some new species. Types of European species sent by Loew, Schiner, Gerstaecker and Jmhoff, have been compared with the American ones. O. Sacken's Catalogue has 139 N. Amer. species, including a large number of Fr. Walker's not yet scientifically compared. Mr. Meade has counted (with a few varieties) 121 species, and Loew's collection contains 12 species not seen by Mr. Meade; therefore the whole number of N.

Am. species is 133. Mr. Meade has identified among them 27 European species and Loew 7 more; therefore 34 species seem to be identical with European ones. The Museum owes the most sincere thanks to Mr. Meade and to Baron v. Osten Sacken.

Genus HYETODESIA Rond. (*Aricia* pt. Macq.)

1. Bears a considerable resemblance to *Aricia marmorata* Zett.; 8 male and female; Lake Super., Huds. Bay Terr., Can., N. Hampsh.  
No specimen of *A. marmorata* is at hand. I consider *A. morioides* Zett. (perhaps *A. mori* Zett. of O. Sack. Cat., p. 164) to be identical with No. 1. Loew's type is a female from Sitka (Sahlberg), and an *Aricia*.
2. Is perhaps a variety of No. 1; the longitudinal thoracic stripes are narrower; 2, male and female; Lake Super., N. Hampsh.
3. Closely corresponds to the descriptions of *A. serva*; this is perhaps also a var. of No. 1; 1, female; Norway, Maine.
4. Seems identical with *A. lucorum* Fall.; 1, male; West N. Y.
5. Is very similar to *A. obscurata* Meig.; 1, male; Huds. Bay Terr.
6. Differs from any species I know; 4, male and female; Brit. Amer., Western N. Y.; Geysers, Cala.

This species is *A. parviceps*, Loew collect., from Sitka, Sahlberg, male, female; the male agrees perfectly with No. 6; the female differs somewhat, but the 4 spec. of No. 6 seem to represent varieties.

7. Bears a very close general resemblance to *S. pagana* Fabr., but differs by having the eyes decidedly pubescent and also by having 3 instead of 4 thoracic bristles behind the suture; 2, male and female; Englewood, N. Jers.; Maine.

This species is identical with *H. angelicæ*, Loew coll., male and female (*Spilogaster angelicæ* O. Sack. Catal., p. 165) and one European type sent by Loew as *Fellaca angelicæ* Scop. The differences quoted above agree with *F. angelicæ*; nevertheless the eyes are a little less pubescent in the only European specimen before me, but decidedly as pubescent in the 2 Amer. specimens in Loew's coll.

There are in Loew's coll. the following species named, all different from the No. 1-7: *A. schinophora*, 3, male and female, from Sitka, Sahlberg, and from Alaska, related to No. 5 but different. *A. consors*, 2, male and female, from Sitka, Sahlberg, allied to No. 6.

*A. spec.*, 1, female, from Wisc., *simillima* *A. Bilbergi*, differt tarsis anticis. In Ent. M. Mag., xiv., p. 250, Mr. Meade has mentioned a species closely resembling *A. lugubris* Meig. This species is not given in his list.

Genus MYDÆA Desv. (*Spilogaster* p. unspotted.)

8. Unlike any species I know ; 1 female, Arctic Amer.
9. Corresponds to the description of *M. floricola* Desv. ; 1 female, N. Y. This is *Spilog. urbana* Loew, O. Sack. Catal., 3, male and female, in Loew's coll. from Br. Amer. and Conn. ; I cannot compare *M. floricola*, but the specimen No. 9 agrees with the European type of *M. urbana* sent by Mr. Meade.
10. Male, Canada ; 11 females and 12 males, Western N. Y. ; 13 females, Catskill Mts., N.Y. ; 14 males, Canada ; 15 males, Arctic Amer. Unlike any species known to me. No. 12 seems to be identical with *A. flexuosa* Loew, male and female, from Sitka.
16. Very similar to *M. flavicola* Fall., but has the external transverse vein straight instead of curved ; 4, male and female, from White Mts., N. H. ; Quebec, Can. ; Huds. Bay Terr. ; Catskill Mts., N.Y. In Loew's coll. labelled *A. diaphana* (*Limnophora diaphana* O. Sack. Catal., p. 166) ; 7, male and female, from N. Hampsh. ; Me. ; Brit. Amer. ; the specimens are identical with European types of *A. diaphana* sent by Loew.
- 16.a. An imperfect species, very like *A. varians* Zett. ; 1 male, Canada ; abdomen wanting ; agrees well with one European type sent by Loew.

Genus SPILOGASTER Macq. (spotted.)

† Legs black. All species unlike any known to me.

17. 3, male and female. Ky. ; Lake Super.—18 ; 1 male, Huds. Bay Terr.—19 ; 1 female, Huds. Bay Terr.—20 ; 1 male, no loc.
21. 1 female, Huds. Bay Terr.—22 ; 1 male, no loc.
- †† Legs wholly or partly yellow.
23. Differs from any species I know, but appears to be the analogue of *S. uliginosa* Fall. ; 2, male ; R. I.

I have compared European types of *S. uliginosa* sent by Mr. Meade and Loew, but they differ so strikingly from No. 23 that I am unable to say why they are analogous.



24. 1 male, Western N. Y.—25. 1 female, Cambridge, Mass. Both unlike any species known to me.  
 26. The generic position of this injured specimen is rather doubtful; 1 female, D. C.  
 27. Corresponds to Rondani's description of *S. hirticrura* and is very like *A. pertusa* Meig.; 7, male and female, from N. Y. and Ill.

I cannot compare *A. pertusa* nor *S. hirticrura*; the species is *Anth. trabeata* Loew; one type of Loew with his label is among the specimens No. 27; in Loew's coll. there are 7 specimens from N. Y., Ill., Pa., D. C.

Mr. Meade says, Ent. M. Mag., *l. c.* p. 251: In *Spilog*, there were eleven species. . . . There was only one male in the collection, and it bore a remarkable resemblance to *Cyrtoneura meditabunda* Fabr. The fifth longitudinal wing vein was curved in a similar manner towards the fourth vein, though in a less degree. . . .

There must be some misunderstanding here which I am not able to solve, as the eleven species before me contain 12 males belonging to 7 species. I have compared every one carefully with a type of *Cyrt. meditabunda* sent by Loew, without finding any male corresponding to the characters of *C. meditabunda*. Later I found among the Diptera not seen by Mr. Meade one female very well agreeing with the characters mentioned, bearing a label *M. meditabunda* ? written by O. Sacken.

#### Genus HYDROPHORIA Desv.

28. Unlike any species known to me; 1 female, Connecticut.  
 29. Resembles *M. ambigua* Fall.; 1 male, Huds. Bay Terr.  
 30. Unlike any species known to me; 1 female, Brit. Amer.

#### Genus DRYMEIA Meig.

31. A well marked species which differs slightly from the only European one, *D. hamata*, 4, male and female, from Huds. Bay Terr.

It is difficult to decide about the similarity with *D. hamata*, as the Amer. specimens are in a rather indifferent condition; the European types sent by Mr. Meade and Loew are much larger. Formerly, *l. c.* p. 251, Mr. Meade had considered them to be quite distinct.



## Genus HYDROTEA Desv.

32. Appears to be identical with *H. dentipes* Fall.; 1 female, Canada.  
In Loew's coll., 2 females, 1 from Sitka, Sahlb., with the same determination.
33. Seems identical with *H. armipes* Fabr.; 3, male and female, Cambridge, Mass.  
In Loew's coll., 1 male from Nebraska with the same determination.

## Genus LASTOPS Meig.

34. Something like *L. canotans* Meig., but it is not identical; 1 male, Br. Colombia..
35. Not like any species known to me: 4, male and female, N. Hampsh.

## Genus OSPHYRA Desv.

36. Similar to *A. leucostoma* Fall.; 5, male and female, from D. C., Mass., Maine.  
In Loew's coll., 5 male and female, from Maine, New York, D. C., identical with No. 36, labelled *A. leucostoma*.
- 36.a. Not like any species known to me; 2, male and female, Canada.

## Genus LIMNOPHORA Desv.

37. Somewhat resembles *A. compuncta* Wied., but has the eyes more widely separated in the male; 6 male and female, from Mass.; N. Y., D. C.; Hudson Bay Terr.
38. 1 male, N. Y.—39; 1 male, Connect.—41; 1 male, Huds. Bay Terr.—42; 1 female, N. Y. 43; 1 male, Mass.—43 a (lost) Huds. Bay Terr. All not like any species known to me.
40. Very like *Coenosia triangulum* Zett. This species might perhaps be placed in the genus *Coenosia*, as the eyes in both sexes are separated by a widish interval. But this occurs to some extent in nearly all the species of this genus; 1 male, Catskill Mts., N. Y.  
*L. stygia* Meig., O. Sacken Catal., p. 152, in Loew's coll. from Sitka, Sahlberg, is not represented among the species examined by Mr. Meade. *L. triangulifera* Zett., †male, labelled by Loew, is in the collection of the Museum.

## Genus HOMALOMYIA Bouché.

44. Identical with *M. canicularis* Linn.; 11 male and female, from South Greenland; Mass., Maine, Conn.

In Loew's coll. are 10, male and female, N. Y., Maine, with the same determination.

45. Identical with *A. scalaris* Meig.; 8, male and female, Maine, Mass., Pennsylvania.

In Loew's coll, 12 male and female, D. C., Pa., Wisc., with the same name.

46. Identical with *M. prostrata* Rossi (*invisurata* Zett.); 2, male and female, N. Y., Mass. There are 3, male and female, from the same locality in the Museum's coll.
47. Probably only var. of *H. canicularis*; 4 females, Middle States, Mass.
49. Not like any species known to me; 1 male, N. Hampsh., abdomen wanting; the other from Hudson's Bay Terr., lost.

Probably *H. serena* Loew, but the specimen is too imperfect to be sure.

50. Not like any species known to me; 4 females, from South Greenland; N. Y. All imperfect.

There are in Loew's collection the following determined species: *H. manicata* Meig., from Sitka, Sahlb.; *H. serena* Fall., from Br. Amer.; *H. subpellucens* Zett., from Sitka, Sahlb.; *H. tetracantha* Loew, from Middle States; *H. femorata* Loew, from Cuba. The *H. spathulata* Zett. quoted with \* in O. Sack. cat., p. 170, is not represented.

#### Genus AZELIA Desv.

51. Seems identical with *A. Slaegeri* Zett.; 1 male, N. Hampsh.

#### Genus ATOMOGASTER Macq.

Is not among the specimens examined by Mr. Meade, but represented in Loew's coll. by 5, male and female, from Texas; Nebr. *A. albicincta*.

#### Genus ANTHOMYIA Meig.

52. Identical with *M. radicum* Linn.
53. 3 males, Regio. arct.—54; 1 male, probably Mass.—55; 1 female, Cambridge, Mass.—56; 2, male and female, no loc.—58; 1 male, Illinois. All not like any species known to me.
57. Identical with *A. latitarsis* Slaeg. & Zett.; 2, male and female, from N. Hampsh. and N. Y.
59. Very similar to small specimens of *A. pluvialis*; 1 male, Long Island, N. Y.

## Genus HYLEMYIA Desv.

† Legs black.

60. Not like any species known to me; 10, male and female, Brit. Am., N. Y., N. J.  
 61. Not like any species known to me; 5, male and female, N. Hampsh., N. Y., Conn.  
 62. Resembles *H. antiqua* Meig.; 2, male and female, Hudson's Bay Terr., Reg. Arctic.

Is identical with *H. deceptiva* A. Fitch, 2 types in Loew's coll.

†† Legs yellow.

63. Not like any species known to me; this is perhaps *A. alcaethoe* Walk. Mus. Cat.; 6, male and female, N. Hampsh., N. Y., Mass.

Is identical with *A. tarsata* Sik., male and female, N. Y., Ill., labelled by Loew.

In Loew's collection are 2 males from Cuba, types of *H. angustifrons* Loew, united (O. Sack. Cat., p. 167) probably after examination of Macquart's type with *H. pici*. Loew has written on the label: "Can be taken to be *H. pici*, if it is assumed that the artist has allowed himself wild fancy in drawing the veins of the wings and the bristles of the legs." On the label of the second specimen is said: "Probably the pale-winged variety quoted by Wiedeman as his *quadrilineata*."

- 64.—73. Unlike any species known to me. 64. 4, male and female, N. Y.—65; 1 female, N. Y.—66; 2 females, N. Hamps.—67; 1 female, Hudson's Bay Terr.—68; 1 male, D. C.—69; 3 females, Hudson's Bay Terr., Canada, N. Hamps.—70; 3 males, N. Y.—71; 2 females, Lake Super.—72; 1 female, Maine.—73; 3 females, Nebraska.

## Genus CHORTOPHILA Macq.

† Legs black.

74. Very similar to *C. floccosa* Meig.; 1 male, Mass.  
 75. 1 male, Mass.—76; 1 female, California—77; 1 male, Regio Arct.—  
 All unlike any species known to me.  
 78. Seems identical with *A. angustifrons* Meig.; 5, male and female, Br. Amer., Maine, Mass.

Is identical with *Anthom. calopteni* Riley, infesting the eggs of *Caloptenus spretus*, after the types in the Museum sent by Mr. Whitmann from St. Paul, Minn.

- 79.—85. 85 *a*. Not exactly like any species known to me. 79. 1 male, Hudson's Bay Terr.—80, 1 male, N. Y.—81; 1 male, Canada—82; 1 male, N. Y.—83; 1 male, Hudson's Bay Terr.—84; 10, male and female, Hudson's Bay Terr., Maine, N. Y., D. C., Arctic Reg.—85; 8 females, Mass., Conn., N. Y.

†† Legs yellow.

- 86.—92 and 96–101. Unlike any species known to me. 86, 1 male, Conn.—87, 2 females, Conn.—88, 1 male, Cala.—89, 3, male and female, N. Y.—90. 5, male and female, N. Y.—91. 7, male and female, Mass., bred from *Rumex* by O. Sack.—92. 1 male, N. Y.—96. 1 female, Hudson's Bay Terr.—97. 1 female, no loc.—98, 1 female, South Greenland. 99, 1 female, Hudson's Bay Terr.—100, 1 female, no loc.—101, 1 female, Regio Arct.

93. Resembles *A. gilva* Zett.; 2 females, N. Y.

94. Very like *A. vittigera* Zett.; 3, male and female, N. Y.

95. Very like *A. flavoscutellata* Zett.; 1 male, N. Hampsh.

In Loew's coll. one species with black legs from Texas is labelled *f. Chort. cilioraca*.

#### Genus LISPA Latr.

102. Like *L. tentaculata* Deg.; 2 females, N. Y.

Identical with *L. sociabilis* Loew; 5, male and female, D. C.

103. Like *L. oliginosa* Fall.; 1 female, Hudson's Bay Terr.

Identical with the same species by Loew from Ill.

104. Not like any European species; 1 female, Maryland.

In Loew's collection are *L. flavicincta* from Hudson's Bay Terr., and *L. consanguinea* from Texas.

#### Genus CARICEA Desv. (Cœnosia Meig.)

105. This very distinct species, of which there are many specimens, is different from any European one that I know; the female closely resembles that of *Mydaea impuncta* Meig. 27, male and female, from Hudson's Bay Terr.; Canada, N. Hampsh., Mass., N. Y.

#### Genus COENOSIA Meig.

- 106–115; 117–121. Not exactly like any species known to me; 106, 4, male and female, N. Y.—107. 3 females, Cuba, is labelled in Loew's coll. *C. strigosa* Loew. 108. 4, male and female, Mass.—109. 3, male and female, N. Hampsh., C. D., is *C. subsimplex*

Loew (not described) from D. C. 110. 2 females, Rhode Island—111. 1 male, Canada—112. 1 male, Canada—113. 2 females, Conn. 114. 1 female, D. C.—115. 3 males, N. Hampsh., Conn., D. C., is *C. calopyga* L. from Pa.—117. 4, male and female, Hudson's Bay Terr., N. Hampsh., C. D.—118. 1 male, Hudson's Bay Terr.—119. 2, male and female, Canada, Mass.—120. 1 female, Hudson's Bay Terr.—121. 1 male, D. C.

116. Very similar to *C. pygmaea* Zett.: 1 male, Canada.

In Loew's coll. is also *C. modesta* from Washington Terr., not from Washington, D. C., as in O. Sack. Catal., p. 171; and *C. nitca* from Pa.

#### Genus SCHOENOMYZA Hal.

In Loew's coll. are the types of *S. chrysostoma* from N. Hampsh., and *C. dorsalis* from D. C.

### NEW SPECIES OF CYNIPIDAE.

BY H. F. BASSETT, WATERBURY, CT.

#### CYNIPS Q. CALIFORNICA, n. sp.

Galls: Polythalamous, sessile on the branches of the Californian White Oak (*Quercus Hindsii*?) Sub-globular, but varying much in form and size. A common form is what may be termed balloon-shaped, the upper part perfectly globular, the lower tapering more or less to the sessile base. They often occur of a long compressed oval form: these are placed longitudinally on the branch and the length is two or three times their breadth or thickness. Those of this form are often of monstrous size, being ten or twelve inches in their greatest circumference. The globular galls are from one to two inches in diameter. In color they are of an opaque white. They are usually smooth, but specimens occur that have a more or less warty surface, and others are found that have slight yellowish brown ridges. Internally they are of a uniform, dense cellular structure, and the not very numerous larval cells (from one to a dozen) lie closely imbedded in this cellular substance.

From their shape and color these galls might easily be mistaken for a species of white fungus which grows on trees.

My specimens were collected in 1878 and in 1880 at Redwood City, Cal., by Mr. Wm. Sutton, of San Francisco.

There are some very large specimens of these galls in the Museum at Cambridge, collected in Cal. by Baron Osten-Sacken, I believe. They are, with a single exception (*Cynips punctata* B.), the largest galls known to me, and I have given them the name of the State in which they, and so many other natural objects of surprising magnitude are found.

The insects gnaw their way out of the galls in October, but of the growth of the galls themselves I have no information. The insects are all females, and belong to the agamous generation, and in structure they differ but little from *C. inanis*, *C. aciculata*, *C. spungifica* and many others that are, as yet, known only in the female sex.

The insect is described as follows :

Head small ; ocelli medium size, very close together. Face covered with short white hairs which are appressed, and which converge towards the mouth. Mandibles large and heavy, shining black at the tips. Maxillary palpi 5-jointed, labial 3-jointed. Antennæ with fourteen joints ; 1st joint short, rather thick ; 2nd small, globose ; 3rd equal in length to the two preceding together ; 4th to the 13th gradually shorter ; 14th long as the two preceding taken together. Thorax with short appressed hairs, and with grooves as follows : Two parallel lines start near together on the collare, near the dorsal summit, and extend half way to the scutellum ; two similar but rapidly diverging lines from the same point on the scutellum, extending half way to the collare. Two starting from the scutellum outside the first pair, and extending to the base of the wings ; these last are nearly parallel. All these grooves are smooth and shining, but very fine and only seen to advantage under a magnifier.

Scutellum nearly oval, surface slightly shagreened and with a few scattering white hairs. Fovæ indistinct or wanting.

Pleurae and legs covered with short shining white hairs. Tarsi dark brown, ungues black. Basal half of the first abdominal segment hairy. Sheath of the ovipositor dark shining brown, not exerted. Ventral hairs microscopic.

Wing veins dark brown, surface of the wings covered with short fine hairs ; radial area open, areolet of medium size. The head—except from the mouth to the occiput, which is black—the antennæ and the entire



R. H. Meade.

1875.

*on the arrangement of the British  
anthomydæ.*

*Annotated List of British  
anthomydæ.*

1881-83.



In his "Cicadinen," 1868, Kirschbaum puts all the species he describes into three sections of *Typhlocyba*, Germ. *In tribus subgenibus*

In 1872, Fieber published his "Katalog der europäischen Cicadinen," in which, on the ground of prior use, he alters *Compsus* to *Alebra*, and *Chloria* to *Chlorita*; and he unites *Erythria* with *Notus*, and *Idia* with *Zygina*. But he relinquishes his former correct idea of *Eupteryx*, Curt., which he calls *Typhlocyba*, Germ., refers the species previously associated under the latter name to *Anomia* and *Zygina*, and drops *Eupteryx*, Curt., altogether; fortunately, these latter arbitrary propositions appear only in a Catalogue, and without show of justification, but it is necessary to notice them to prevent misconception by those who follow.

(To be continued).

ON THE ARRANGEMENT OF THE BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

The small and sombre flies comprised in the Dipterous family *Anthomyiidae* are very little known to British entomologists; but their numbers, both in species and individuals, are so great in this and other cold and temperate climates, that they deserve more attention than they have received. They are confessedly difficult to determine; but this very difficulty adds to the interest which they should excite, and

is truly more apparent than real; for, though many species are exceedingly alike, when closely examined, good distinctive characters may mostly be found for their separation.

To facilitate their examination and description, it is imperatively necessary to sub-divide them into groups or genera; and though some of these must be more or less artificial, this is a small evil in comparison with leaving 200 or 300 species in one genus.

It is for the purpose of calling the attention of British entomologists to this family (which has been most carefully studied upon the Continent) that I venture to publish a few remarks on the characters of the principal generic sub-divisions into which our indigenous species may be classed, and I shall endeavour to arrange them, as far as possible, into natural groups.

Meigen, to whom all Dipterologists owe so much, first detached these flies from the great tribe of *Muscidæ*; but he retained almost all the European species in one genus, which he named *Anthomyia*. In his seventh or supplementary volume, however, published in 1838, he raised them to the rank of a separate family, and adopted some of the new genera which had then been formed.

Dr. Robineau Desvoidy, in his "Essai sur les Myodares" (1830), first sub-divided this family (which he named *Mesomyidæ*) into a great number of small groups; but he went as much too far in the formation of genera as he did in the sub-division of species, for both are characterised by such insufficient and undecided characters, that they are practically useless. Macquart\* reduced the chaos created by Desvoidy into something like order, and his genera (which were made with great skill) have been adopted, with various modifications, by most subsequent authors, with the exception of Zetterstedt, who, in his great work upon the *Diptera* of Scandinavia, includes almost all the *Anthomyiidæ* in two genera; one characterised by having entirely black legs, and the other by the legs being partly or wholly yellow.

Rondani, the most recent systematic writer upon the *Anthomyiidæ*, has, in his work upon the Italian *Diptera*, very carefully and elaborately revised the genera into which they may be sub-divided, adding a good many new ones, and altering the names of others; and, although he may have carried his alterations a little too far, he has done much valuable work.†

The *Anthomyiidæ* may at once be known from the typical flies

\* Hist. Nat. des insectes diptères, 1835.

† Schiner's valuable work upon the *Diptera*, in the "Fauna Austriaca," may also be mentioned.

(*Muscides*), as the house-fly and blue-bottle, by having the first posterior cell of the wings open at its extremity, the fifth longitudinal or præbrachial vein running straight or nearly straight to the margin of the wing, while it is curved or bent at an angle towards the fourth or cubital vein in the true *Muscides*. They may also be distinguished from the more feebly developed or acalypterate families of *Muscide* either by the approximation of the eyes of the male, or by the size of the alulets, which, though sometimes small, are always very distinct in the *Anthomyiide*, even in those genera in which the eyes are widely separated in both sexes.

It is of importance to determine which are the most constant, and therefore most valuable points of structure, for the formation of genera.

The relative size of the scales of the alulets may first be mentioned. In the more typical species they are generally tolerably large, and the lower scale projects considerably beyond the upper; but in many others they are small, and nearly or quite of the same size, so that one scale completely covers the other.

In some large groups the arista or style of the antennæ is hairy or plumose, in others only tomentose or bare.

In many species the eyes are hairy, in a still greater number naked.

In some divisions the abdomen is always spotted, or provided with sub-anal appendages.

The body and legs are often furnished with various teeth, spines, hairs, and bristles, which are generally constant in form and position, and become very valuable characters for the formation of genera, when they are similarly placed in a number of allied species. I am indebted to Mr. Verrall for pointing out to me that there are two rows of dorsal bristles always present upon the thorax, in addition to others scattered on the sides, in which the number of setæ is always constant in individuals of the same species. There are two (in a few kinds, only one) in front of the transverse suture, by which the thorax is intersected, in a longitudinal line with either three or four strong bristles behind it.

In addition to the features I have mentioned, the length and direction of the veins of the wings is very characteristic of certain groups, as is also the shape of the head and abdomen; and two genera may be known, one by the peculiar shape of the proboscis, and the other of the palpi.

I will now endeavour to arrange the genera in a tabular or analytical form, and then make a few illustrative remarks upon each genus.

GENERA ANTHOMYIDARUM.      TABULAR ARRANGEMENT.

- A. Eyes approximate or contiguous in the males, but distant in the females.  
 B. Scales of the alulets unequal in size, the under one being larger than the upper.  
 C. Arista plumose, the hairs on the style sometimes short but always distinct.  
 D. Eyes hairy.  
   E. Alulets large.  
   F. Abdomen somewhat hemispherical, and borders of facial groove setigerous  
   FF. Abdomen generally oval, borders of facial groove without bristles  
   DD. Eyes naked, or very slightly pubescent  
   G. Abdomen spotted and mostly oblong  
   GG. Abdomen without distinct spots, and furnished with sub-anal appendages in the male  
   H. Proboscis elongated and bent forwards, with a hooked and pointed extremity  
 CC. Arista pubescent or bare.  
   I. Anterior femora toothed in the males.  
   J. Eyes hairy  
   JJ. Eyes naked, or only slightly ciliated  
   K. Eyes hairy  
   KK. Eyes naked.  
   L. Posterior tibiae curved in the males  
   LL. Posterior tibiae of the ordinary form, and the middle tibiae furnished with bristles on their external as well as posterior surfaces, in addition to those at their extremities.  
   M. Abdomen spotted  
 EE. Alulets small, but the lower scales not quite covered by the upper.  
   N. Head semi-circular, without projection of forehead or epistome.  
   O. Seventh longitudinal or anal vein of the wings very short, with the sub-axillary vein curved towards its extremity.  
   P. Abdomen flattened  
   PP. Abdomen narrow, cylindrical, and spotted  
   NN. Head more or less angular, with forehead or epistome projecting.  
   OO. Anal vein prolonged to the margin of the wing  
 BB. Lower scales of the alulets entirely covered by the upper.  
   P. Arista plumose  
   PP. Arista pubescent or bare.  
   Q. Head often large, but cheeks not inflated and setose  
   QQ. Cheeks swollen and bisute  
   R. Alulets moderate in size, the lower scale longer than the upper.  
   S. Palpi spatulate in form  
   SS. Palpi of ordinary form.  
   T. Arista plumose  
   TT. Arista pubescent or bare  
   RR. Alulets small, the lower scale nearly or wholly covered by the upper.  
   U. Arista distinctly plumose.  
   VV. Abdomen with sub-anal appendages in the male  
   UU. Abdomen of male without appendages  
   UU. Arista bare.  
   W. Seventh longitudinal or anal vein of wings very short.  
   XX. Genus *Macrosoma* of Desvoidy. This name, however, had been previously given to another genus of animals.  
   + This corresponds in part to the genus *Aricia* of Desv. and Macquart, a name which had been previously occupied by Savigny.

1. POLIETES,\* Rondani.
2. HYTODESIA,† Rond.
3. MYDEA, Desvoidy.
4. SPLOGASTER, Macquart.
5. HYDROPHORIA, Desv.
6. DRYMEIA, Meigen.
7. ONODONTA, Rond.
8. HYDROTEA, Desv.
9. LASIOES, Meig.
10. OPHYEA, Desv.
11. LIMNOPHORA, Desv.
12. HOMALOMYIA, Bouché.
13. AZELLA, Desv.
14. ANTHOMYIA, Meig.
15. HYLEMYIA, Desv.
16. CHORTOPHILA, Macq.
17. ERIPHIA, Meig.
18. LISPA, Latreille.
19. CARICEA, Desv.
20. CENOSIA, Meig.
21. OPHOGASTER, Rond.
22. MYCOPHAGA, Rond.
23. SCHENOMYZA, Haliday.



**POLIETES.**—This genus was separated by R. Desvoidy from the *Anthomyiidae* and placed among the *Muscides*, from the resemblance which the two species contained in it bear to some of the more highly developed flies; but it possesses the essential character of the family in a very high degree, the fourth and fifth longitudinal veins diverging considerably from each other at their extremities, thus leaving the first posterior cells of the wings widely open. Of the two species which it contains, one is the well known *Musca lardaria*, Fab., in size and form much like the common blue-bottle fly, but lighter and greyer in colour; and the other the *Musca albo-lineata*, Fall., the *Macrosoma floralis* of Desvoidy, which closely resembles *Cyrtoneura hortorum* in colour and markings.

**HYETODESIA.**—This includes all the species (except the two in the previous genus) which have plumose antennæ and hairy eyes. It corresponds to the first half of the genus *Aricia* of Macquart and others. The typical species are mostly of considerable size, have an oval abdomen, and form a very natural group; but a good many aberrant species of small size and oblong form are obliged to be associated with them.

(To be continued).

*Y. Ant. 1. 220.*

# DESCRIPTION OF A NEW SPECIES OF *BRASSOLINÆ* FROM BOGOTÁ.

BY W. L. DISTANT.

## OPSIPHANES BOGOTANUS, n. sp.

Wings above, chocolate-brown, front wings with first half of costal area of a more rufous-brown, from which, near the base, a semi-circular patch of the same colour extends over about one-third of discoidal cell to base of internal area, a somewhat irregular band of yellowish-white extending from costal margin immediately past extremity of cell to external angle, widening below cell and terminating in a smallish sub-marginal patch; three sub-apical white spots. Hind-wings with abdominal half of a more rufous-brown, which occupies lower half of cell and extends through second median interspace to abdominal area which is yellowish-white, two sub-marginal, somewhat obscure, narrow waved bands of darker brown.

Wings below very similar to *O. Crameri*, Felder, and to *O. Orgetorix*, Hewitson.

Expanse of wings, 4 in. 2 lin.

Hab.: Bogotá.

A female, apparently of this species, is in the National Collection from Venezuela, and in colour and markings somewhat closely resembles *O. Crameri*, Felder.

Streatham Cottage, Bueclench Road,  
West Dulwich, S.E.:  
January 2nd, 1875.

DESCRIPTION OF THREE NEW SPECIES OF *TRIGONURUS*.

BY D. SHARP, M.B.

Dr. Leconte has recently described a number of the more interesting of the new species of *Coleoptera*, discovered by the lamented G. R. Crotch, in California. Among these descriptions are to be found two new species of the important genus *Trigonurus*,—noteworthy for the New-world Coleopterous fauna. I have for some years possessed three species of *Trigonurus* from California, and supposed, on receiving Dr. Leconte's paper, that I should find two of them to be his new species. Such, however, proves not to be the case; for, after examination of Leconte's descriptions, I am obliged to conclude that I possess neither of his two species; and I think it will be of interest, therefore, to publish descriptions of the three species in my collection.

*TRIGONURUS RUGOSUS*, n. sp.

*Castaneus, opacus, sub-parallelus; thorace sub-quadrato, basi bisi-nuato, angulis posterioribus leviter acutis; elytris dense, fortiter, ruguloso-et striato-punctatis, apice recte truncatis; abdomine crebre fortiter punctato.*  
*Long. corp. 5 mm.*

Head coarsely and closely punctured, with a deep transverse impression between the insertion of the antennæ. Thorax very nearly as long as broad, the sides a little narrowed in front of the middle: it is densely and coarsely punctured, with a longitudinal impression along the middle, which does not reach the base; and it has also on each side a rather large but ill-defined basal impression just within the angles. The elytra are one and a half times the length of the thorax, but only slightly broader than it; they are very coarsely punctured, and the punctures are arranged in rows, but they are very close together and the interstices are irregular or rugulose; the hind-body is rather closely and coarsely punctured.

The dense coarse sculpture rendering the upper surface opaque, and the truncate apex of the elytra, make this species very easily distinguishable from all others of the genus.

In its structural characters this species closely approaches *T. Mellyi*; nevertheless, a difference exists between the two in the structure of the prosternum; in *T. rugosus*, the posterior side piece of the prosternum forms a true triangle; it is a little further removed from the front piece, the result of which is that the front coxæ of *T. rugosus* are rather more enclosed behind, but are more uncovered at the sides than in *T. Mellyi*; should this structure be found similar in the other American species, it may be sufficient to warrant the establishment of a separate genus. In both *T. Mellyi* and *T. rugosus*, a trochantin of the front coxæ is very distinctly visible.

Ent. Fr., 1862), the present *Gymnetron* must be closely allied to *G. pilosum*, Besser, a species which occurs in southern Europe and the north of Africa; nevertheless, it would appear to be not quite so large, and to have the antennæ (except the club), the tibiæ, and the tarsi, of a bright rufo-ferruginous; and its elytra are, I suspect, more straightened at the sides. It is depressed and black, and its entire surface is densely clothed with elongated cinereous hairs, which are intermingled with a few darker ones; and its scape is somewhat lengthened, and its tibiæ are unusually robust, for a member of this genus. T. V. W.

### Genus PIMELIA.

Fabricius, *Syst. Ent.*, 251 (1775).

#### PIMELIA MALLEATA, *sp. n.*

*P. parva, subnitida; capite prothoraceque distincte et argute asperato-punctulatis (punctis in medio gradatim minutoribus, sed antice et versus latera majoribus, necnon in hoc in tuberculos magnos transientibus), hoc brevi, ad latera valde rotundato, basi sinuato, et utrinque in disco plus minus irregulariter inæquali: scutello parvo, scutiformi; elytris valde malleato-inæqualibus, aut transversim grosse rugatis, fere punctorum, granulorum costarumque carentibus; pedibus nigro-piceis.*

*Long. corp. lin. 6-6½.*

*Habitat in montibus "Atlas," a peritiss. J. D. Hooker, M.D., parce deprehensa.*

A very distinct little species, which may easily be known by its comparatively small size (for a *Pimelia*), by the conspicuous subasperated punctules of its head and prothorax (the latter of which is considerably rounded at the sides), by its rather small and scutiform scutellum, and (more particularly) by the structure of its elytra—on which the punctures, tubercles, and costæ are almost obsolete, but which have their entire surface coarsely wrinkled, or transversely *malleated*—the inequalities, however, becoming less decided as they approach the scutellum. The discovery of this species is due to the researches of Dr. J. D. Hooker, who met with it, as I am told by Mr. Blackmore, in the "middle regions" of the Atlas range.

T. V. W.

### Genus HOPATRUM.

Fabricius, *Syst. Ent.*, 76 [*script. Opatrum*] (1775).

#### HOPATRUM HOOKERI (Blackmore, *in litt.*), *sp. n.*

*H. oblongum, nigrum, rugulosum, opacum, subcalvum (sc. subtilissime, brevissime, et parcissime griseo-pubescent); genis ante oculos valde exstantibus, rotundato-angulatis; capite prothoraceque dense, profunde, et confuse asperato- (aut granulato-) punctatis, hoc lato, ad latera æqualiter rotundato, angulis posticis acutis, postice in*

*medio obsolete carinulato; elytris antice prothorace angustioribus, humeris acute angulatum exstantibus, obsolete punctato-striatis, minute sed vix dense granulatis, interstitiis alternis obsolete obtuse elevatis; antennis tarsisque rufo-piceis.*

*Long. corp. lin. vix 4.*

*Habitat editiores montium "Atlas," in ascensu Djebel-Tezah (inter 9,000 et 11,000 s. m.) a clariss. Doct. J. D. Hooker repertum; necnon in honorem captoris amicæ mente a Dom. Blackmore dicatum.*

Well distinguished amongst the *Hopatra* by its rather largely developed and equally-rounded prothorax (which, together with the head, is closely and coarsely subpunctate-granulate), by its nearly bald surface, and by its elytra (which are a little narrower anteriorly than the prothorax, and have their humeral angles acute and prominent) being less densely sprinkled with much smaller granules, and with their alternate interstices obtusely and obsoletely raised. I have had much pleasure in retaining for it the name proposed by Mr. Blackmore, who is desirous to place on record the obligations of entomologists to Dr. Hooker for the interesting *Coleoptera* brought by him from the hitherto unexplored regions of the Atlas. T. V. W.

## ON THE ARRANGEMENT OF THE BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

(concluded from page 203.)

**MYDÆA.**—I have placed in this genus a number of species mostly of considerable size and oval form, which differ from those in the genus *Hyetodesia* by having naked eyes, and from those in *Spilogaster* by having unspotted bodies. Macquart placed them in the second division of his genus *Aricia*; and Schiner and Rondani have included them in *Spilogaster*; they appear, however, to form a more natural group than many others that have been raised to the rank of genera. I have adopted the name of *Mydæa*, as it had been applied by Desvoidy to *M. pagana* and to one or two others of the leading species in the genus.

In this and the two preceding genera two thoracic bristles are placed in front of the transverse suture, in a line with four behind it, in all the British species I have examined, with the exception of *Hyetodesia læta*, which has only three behind the suture.

**SPILOGASTER.**—This genus, as its name implies, is characterised by the species having the body spotted; four, or sometimes six, distinct and often triangular spots being arranged in pairs (one on each side of the median line) on the dorsum of the second, third, and some-

times of the first, segments of the abdomen. The arista is always furnished with distinct, though sometimes short, hairs, and the eyes are naked.

The number of thoracic bristles in the line beyond the suture (two always being in front) varies from three to four; they are always constant in number, however in the same species, and are therefore of great specific value, sometimes enabling two otherwise closely allied species to be at once pronounced distinct.

The flies in this genus are generally smaller, more oblong in shape, and altogether less highly developed than those in the preceding genera. The species are rather numerous and difficult to name.

**HYDROPHORIA.**—This genus, of which *H. conica* is the type, is characterised by the species having plumose antennæ, naked eyes, unspotted oblong or oblong-conic bodies, and subanal genital appendages in the males. There are four thoracic bristles behind the suture, the last or hindmost of which is always smaller and weaker than the others. This is only a small genus.

**DRYMEA.**—This genus is very well marked, but only contains a single species, which may at once be recognised by the elongated, bent, and pointed proboscis. This fly, named *D. hamata*, is black and very hairy, has the thoracic bristles arranged two in front and three behind the suture, and has the arista furnished with very short hairs, by which character it forms a connecting link to the species in the next sub-division. *D. hamata* may be found in some places in abundance in the autumn, upon the flowers of the common hawkweed (*Hieracium pilosella*) and other *Compositæ*.

**OXODONTA and HYDROTÆA.**—These two genera may be mentioned together, as they only differ by having the eyes hairy in the former and naked or very slightly tomentose in the latter. The species of both may at once be known from all the other *Anthomyiidae* by the anterior femora of the males being furnished with one or two teeth near the end. The corresponding tibiæ are also mostly notched.

The dorsal thoracic bristles are six in number, two in front and four behind the suture. These two genera form a very natural group. *H. meteorica* and other allied species swarm in woody places, and torment horses, especially in damp warm weather.

**LASIOPS.**—This is a very artificial genus, formed by Meigen to include a few aberrant species which have a naked arista, and hairy eyes. One (*L. cunctans*) closely resembles an *Onodonta*, only the anterior femora are without teeth; another is very like a *Hyetodesia*.



with the exception of having a naked arista; and a third, which is very common, is so similar to an *Anthomyia*, except in its hairy eyes, that it has been named by Rondani *L. anthomyinus*.

**OPIRYA.**—The typical species in this small genus (*O. leucostoma*) is characterised by the curved hind legs, dark metallic blue-black oval body, naked arista and eyes.

**LIMNOPHORA.**—This genus is so closely related to *Spilogaster*, that it is rather difficult to define the limits between them. Thus Schiner includes in *Limnophora* all those species with spotted oval or oblong bodies, and naked eyes, which have a short haired arista. Rondani, on the contrary, restricts it to those only which have quite, or nearly quite a naked arista, and, at the same time, have the tibiæ of the middle pair of legs furnished with one or more setæ or short bristles on the middle of their external as well as posterior surfaces, in addition to the usual apical ones. He thus contracts the genus within very narrow limits, and I think it better to do so, as we can then define it accurately; for it is found that in all the spotted species with a plumose arista, whether long or short haired, forming the genus *Spilogaster* proper, the middle tibiæ have no bristles on their external surfaces. In this and the two preceding genera there are six thoracic bristles.

**HOMALOMYIA.**—This is one of the best defined and most natural genera in the family. The species may be recognised at once by having a smooth semi-circular head, without any projecting angles, and by the eyes being very large and extending much lower over the face than in the species of other genera, so as to cover the cheeks. The alulets are small, but the lower scale is not quite covered by the upper one. The abdomen is rather elliptical and flattened, and is very commonly figured on the dorsum in the males, with a central line of triangular marks. The shortness of the anal vein of the wings, with the curving of the axillary vein towards its extremity, is very characteristic of this and the following genus.

The males of these common little flies, the best known of which are *H. canicularis* and *H. scalaris*, are often seen sporting in troops in the air in summer, performing aerial dances after the manner of the *Tipulidæ*.

**AZELIA.**—This small genus, named *Atomogaster* by Macquart, may be known at once from *Homalomyia* by the species being of a velvety-black colour in the males, and having a narrow cylindrical abdomen marked by three rows of dots, which are so arranged as to form a series of triangles.



The males of these pretty little flies are usually found in greater abundance than the females, but I have frequently caught the latter upon the droppings of horses and cows in the roads and fields. They doubtless deposit their eggs in the dung.

**ANTHOMYIA.**—The restricted genus *Anthomyia* contains the last batch of species in the division, having the scales of the alulets of unequal size. The flies comprised in it have a bare, or nearly bare, arista, and differ from those in the two preceding genera by having the head more or less angular; the face and epistome often projecting considerably. They also have the anal vein prolonged to the margin of the wing. The shape, as well as the colour and markings of the abdomen, vary greatly, and the genus is not upon the whole a natural one, but requires subdivision. The typical species of this genus are *A. pluvialis* and *A. radicum*.

In the last three genera, the species, with a few exceptions, have five dorsal bristles upon the thorax, two in front and three behind the suture.

**HYLEMYIA.**—This genus so closely resembles *Hydrophoria*, chiefly differing by the smaller and equal size of the scales of the alulets, that the two have been included in one by Schiner and others.

The abdomen is oblong or rather cylindrical, and generally furnished with subanal appendages. The dorsal bristles are five in number, but, as in *Hydrophoria*, a sixth smaller one is often placed behind the others. This genus includes a large number of species.

**CHORTOPHILA.**—This is also a large genus. Many of the species resemble, in general appearance, those of *Hylemyia*, having cylindrical bodies and subanal appendages, but differ by the arista being bare; others are closely allied to the *Anthomyia*, but have the scales of the alulets of equal, instead of unequal, size. Many of the species in both these last genera are small and difficult to name, the descriptions of authors not being sufficiently precise, or not based upon characteristic points of structure.

**ERYPHIA.**—I have included this genus in the British list, but I have not yet seen a specimen of the single Alpine species which it contains.

**LISPA.**—In this and the succeeding genera the eyes are widely separated in both sexes. The species contained in the present one may at once be recognised by the form of the palpi, the extremities of which are dilated into flattened knobs. They are not common.

CARICEA.—This and the four succeeding genera have all been included by Meigen, Macquart, Schiner, and others, in the genus *Cænosiæ*; but they differ from each other, as I have pointed out in the analytical table, by the relative size of the alulets, as well as by the state of the arista. These genera, upon which I shall not further dilate, include a considerable number of small flies, many of them found by sweeping among grass and herbage. They are of various shapes and colours, and only agree in having the eyes distant in both sexes. Their bodies are mostly spotted. The number of dorsal bristles varies considerably in the different species; thus there is only one in front of the suture, and three behind it, in *Caricea tigrina* and *Cænosiæ sexnotata*; while in *Caricea ciliacosta* and *Cænosiæ nigripes* there are two in front and four behind: again, other species, as *Cænosiæ meditata*, have two in front and three behind; while, therefore, these dorsal bristles are very valuable specific characters, they are here of no use in a generic sense.

In concluding these few remarks upon the *Anthomyiidae*, I beg to say that I shall be much obliged to any entomologist who will forward any specimens of this family for my inspection, and I will undertake to return them named as accurately as is in my power.

Bradford, Yorkshire: December 1st, 1874.

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#### ON *ASPHONDYLIA ULICIS*, TRAILL.

BY G. H. VERRALL.

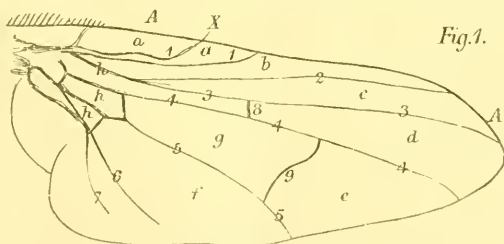
In the number of the Scottish Naturalist for October, 1873, Mr. J. W. H. Traill describes a gall found on *Ulex europæus* on Scotston Moor, near Aberdeen, and slightly describes the perfect insect, which he names *Asphondylia ulicis*. Thinking a more detailed description advisable, in order to confirm Mr. Traill's name, I wrote to Mr. W. A. Vice asking for specimens, and he sent me two long ago; but, owing to their having fared badly in travelling, I did not attempt to describe them. Last August, I was collecting in company with Mr. J. Scott between Poole and Bournemouth, and when glancing over a few *Diptera* he had in his collecting bottle, I remarked that one resembled the *Asphondylia* sent by Mr. Vice, and, looking at the first piece of furze by my side, I noticed the galls in abundance. Upon my return home, I found that when I visited Bournemouth in July, 1871, I had caught half-a-dozen of the insect, having, no doubt, been attracted by its large size for a *Cecidomyia*. With the help of these, I therefore give a short description.

ANNOTATED LIST  
OF  
BRITISH ANTHOMYIIDÆ.  
BY  
R. H. MEADE.

*Reprinted from "The Entomologist's Monthly Magazine," Vol xviii.*

In the following paper I shall attempt to give a list of the British species comprised in the great Sub-Family of *Muscidæ* named *Anthomyiidae*. This group of flies may be distinguished from the more highly developed or typical *Muscidæ* by the first posterior wing-cell being fully open; the fourth longitudinal vein running direct to the margin of the wing, without being bent upwards towards the third longitudinal vein in a curve or angle as in the *Tachinidæ* and *Muscidæ*. The *Anthomyiidae* are separated from the various groups of smaller or acalypterate *Muscidæ* by the alulets or scales being more or less highly developed.

For the illustration of the characters of some of the genera, and also of distinctive points in new or obscure species, it will be useful to introduce some figures of the wings, and I shall first insert an explanatory sketch to enable the student to understand the names of the veins and cells to which reference is made. The terms which I have adopted are the same as those used by Loew in his introductory chapter on the terminology of *Diptera*, inserted at the beginning of the first part of his Monographs on the *Diptera* of North America.



\* Fig. 1—Wing of *Hyelodesia lucorum*.

A.A. costal vein; 1.1. first longitudinal vein, often double, when the second branch is named the axillary vein; 2. second longitudinal vein; 3.3 third longitudinal vein; 4.4.4. fourth longitudinal vein; 5.5. fifth longitudinal vein; 6. sixth longitudinal or anal vein; 7. axillary vein; 8. internal transverse vein; 9. external transverse vein; a.a. costal cells; b. marginal cell; c. submarginal cell; d. first posterior cell; e. second posterior cell; f. third posterior cell; g. discoidal cell; h.h.h. basal cells; X. costal spine, always (when present) at the point of termination of the first branch of the first longitudinal vein.

In the 11th volume of this Magazine, p. 199, I gave a sketch of

the different genera into which the numerous species of this Sub-Family may be grouped. More extended experience has caused me to somewhat modify my views, and to introduce some new genera; therefore, before enumerating the species contained in each genus, I shall briefly give the characters by which such genus may be distinguished from the others; and at the end of the list of species in each genus, I shall make a few remarks on such species as possess points of interest or obscurity, and lastly describe any new species.

### 1. POLIETES, Rond.

*Macrosoma*, R. Desv.

*Aricia*, pt., Auctt.

*Gen. ch.* — Eyes hairy, contiguous in males; arista plumose; margins of facial groove ciliated from the vibrissæ to the base of the third joint of the antennæ; alulets large, the lower scale twice as long as the upper; abdomen short and rounded; bristles on the back of thorax and abdomen small and soft; anal vein terminating a short distance from the margin of the wing.

#### 1. LARDARIA, Fab.

#### 2. ALBO-LINEATA, Fall.

*floralis* ?, Desv.

### 2. HYETODESIA.

*Yetodesia*, Rond.

*Aricia*, pt., Auctt.

*Gen. ch.* — Eyes hairy, contiguous or approximate in the males; arista plumose or sub-plumose; facial groove bare, or nearly so; alulets generally large, but variable in size, the lower scale however always longer than the upper; abdomen oval or oblong; anal vein prolonged, but not reaching the margin of the wing.

#### Sect. 1—*Legs entirely black.*

##### 1. INCANA, Wdm.

##### 2. LUCORUM, Fall.

##### 3. MARMORATA, Zett.

##### 4. SERVA, Meig.

##### 5. DISPAR, Fall. *nivalis*, Zett.

##### 6. DUBIA, *sp. n.*

##### 7. OBSCURATA, Meig.

##### 8. VARIABILIS, Fall.

##### 9. LONGIPES, Zett. *atra*, Fall.

##### 10. UMBRATICA, Meig.

##### 11. SEMICINEREA, Meig.

#### Sect. 2—*Legs partly pale (fulvous or rufous).*

##### 12. LÆTA, Fall.

##### 13. PERDITA, Meig. *trimacula* ?, Bouché.

##### 14. ERRANS, Meig.

##### 15. SIGNATA, Meig.

##### 16. LASIOPHTHALMA, Macq.

##### 17. VAGANS, Fall.

##### 18. ERRATICA, Fall.

##### 19. BASALIS, Zett.

##### 20. RUFIPALPIS, Macq.

##### 21. ABDOMINALIS, Zett.

##### 22. SIMPLEX, Wdm. *posticata*, Meig. & Zett.

##### 23. SCUTELLARIS, Fall. *populi*, Meig.

##### *variegata*, Meig.

##### 24. PALLIDA, Fab.

### H. SERVA, Meig.

The specific characters assigned to this species are insufficient to distinguish it from its congeners, especially from *H. lucorum* and *H. marmorata*; it may, however, be easily determined by the following points of difference: in *H. serva* there are only three bristles behind the transverse suture on the thorax, in each of the two parallel longitudinal rows of setæ which are placed between the middle and lateral black stripes; while in *H. lucorum* and *H. marmorata*, as in most of the higher Anthomids, there are four bristles in each row behind the suture. In *H. serva* the external transverse vein of the wings is straighter than in either of the other species, and not clouded with brown. The abdomen in *H. serva* is without the rounded black spots seen in *H. lucorum*, but marbled or tessellated as in *H. marmorata*. The posterior tibiæ of the males in *H. serva* have no long hairs or cilæ on their inner sides, while in *H. lucorum* they are thinly ciliated with a few long hairs along the upper two-thirds of their inner surfaces, and in *H. marmorata* along their lower two-thirds. *H. serva* is usually rather smaller than either of the other two species. It is much less common than *H. lucorum*.

### H. DISPAR, Fall.

There is no doubt but that this is synonymous with *H. nivalis*, Zett. Rondani describes the latter species as having the posterior tibiæ densely ciliated ("*intus sub-barbatis seu dense villosis*"). He does not describe *H. dispar*, and neither Fallen, Meigen, nor Zetterstedt says anything about the armature of the legs in either species; so, following Rondani, I named the first specimens of this fly that I saw *nivalis*; but, upon obtaining typical individuals of *H. dispar* from the continent, I found that they had also the beards on the posterior tibiæ, and were in every way identical with the English specimens named *nivalis*, so Fallen's name must stand. This species is rare: I received one male from Mr. C. W. Dale (Dorset), and found one in a collection of unnamed insects made by the late Mr. F. Walker.

### H. VAGANS, Fall.

I have introduced this species into the British list upon the authority of the late Francis Walker; but I have never seen a specimen, either English or continental, that agrees with the description given by authors. Mr. Kowarz, of Franzensbad, sent me two which he had taken from the collection of Professor Loew, in which they were placed and named as *vagans*, but they were exactly similar in all points to *H. basalis* of Zetterstedt, only of rather a larger size. The femora were all entirely pale, and the palpi black, while in the description of *vagans* given by Fallen and Meigen the anterior femora are given as partly black, and Meigen says the palpi are red at the base. I suspect that *H. vagans*, Fall., and *H. basalis*, Zett., are only varieties of the same species, but this can only be determined by the examination of typical specimens in the collections of Fallen and Meigen.

### H. SCUTELLARIS, Fall.

This species varies very much in several particulars, and has, on this account, been described under several different names. Sometimes the antennæ are entirely black or grey, at other times the first two joints are rufous. In some specimens the arista is longer-haired than in others. The scutellum is sometimes entirely yellow,



but it is often more or less grey at the base. Again, there is often a narrow longitudinal black stripe on the dorsum of the first and second abdominal segments, as well as a black line on the posterior edges of the segments, while in other specimens the abdomen is entirely unmarked. These and some other minor distinctions are by no means constant, and I can find no essential differences of structure; therefore I believe the *H. populi* and *H. variegata* of Meigen are only varieties of *H. scutellaris* of Fallen.

### H. DUBIA, *sp. n.*

*Oblongo-ovato cinerea; fronte rix prominente; ore non producto; oculi in mare subcontigui; seta breviter plumata; thorace lineis quatuor distinctis nigris; abdomine vitta dorsali maculisque indeterminatis nigro-fuscis; vena transversali interna pone medium cellulæ discoidalis posita.* Long.  $3\frac{1}{2}$  ad 4 lin.

*Head:* forehead very slightly prominent; eyes of male long-haired and subcontiguous, separated by a narrow black line, which is bordered by a silvery-white margin; face silvery-white, with black reflexions; epistome slightly projecting; antennæ narrow, third joint about twice the length of second; arista short-haired.

*Thorax* light ash-grey, with four longitudinal very distinct black stripes nearly equal in width, but varying somewhat in breadth in different specimens; the outer pair interrupted at the suture; scutellum covered with ash-grey tomentum, of which it is sometimes partially denuded so as to leave a black spot at the base or in the centre; four setæ are placed longitudinally on each side behind the suture in the space between the middle and lateral stripes.

*Abdomen* grey, with a longitudinal black stripe extending on the dorsum over the first two or three segments; sides marked or tessellated with black patches, which assume the form of irregularly shaped spots on the bases of the segments, when viewed in some directions; third segment without setæ on the disc.

*Wings* slightly tinged with yellow at the bases and along the veins; internal transverse vein placed a little behind the centre of the discoidal cell, and almost exactly opposite the end of the auxilliary vein; external transverse vein slightly oblique and a little sinuous.

*Calyptra* nearly white. *Halteres* yellow. *Legs* black; posterior tibiæ without any long hairs on their anterior or inner surfaces, and with only a few setæ on their outer sides.

This species is not common. I have three British specimens, one of which I captured near lake Windermere, and another near Wakefield; I also received one from Mr. Kowarz, of Franzensbad, taken in Hungary. I first named it *H. lugubris*, Meig., but, on receiving a typical specimen of that species from the continent, I at once saw that they were quite distinct. It more closely corresponds to the description of *H. consobrina*, Zett., and is perhaps the same, but Zetterstedt's account is so short and incomplete, that his species cannot be identified with certainty without the examination of the specimens in his collection, so I have thought it better to describe it as new.

It may be distinguished from *H. lugubris* of Meigen (*H. morio*, Zett.), of which I have not seen a British specimen, by the mouth being much less prominent and less hairy; by the thorax being more grey and more distinctly striped; by the dorsal abdominal stripe being narrow and nearly even, while in *lugubris* it is dilated on



each segment into a wide triangular mark; by the posterior tibiæ being much more thickly and strongly ciliated on their outer sides in *lugubris*; and lastly, by the internal transverse vein being placed before the centre of the discoidal cell in *lugubris*, instead of behind it as in *dubia*, and therefore some way before the termination of the auxilliary vein.

*H. dubia* bears considerable resemblance to *H. serva*, but may be easily distinguished by the arista being much longer-haired in the latter species, and by there being four thoracic setæ behind the suture in *dubia* and only three in *serva*. By the light grey colour and distinct stripes of the thorax, *dubia* bears a considerable resemblance to *H. lata*, but the latter has only three posterior thoracic dorsal bristles as in *serva*, and pale coloured tibiæ.

(To be continued).

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ANNOTATED LIST  
OF  
BRITISH ANTHOMYIIDÆ.  
BY  
R. H. MEADE.

*Reprinted from "The Entomologist's Monthly Magazine," Vol. xviii.*

3. MYDÆA, R. Desv.

*Spilogaster*, pt., Auctt.

*Aricia*, pt., Macq.

*Gen. ch.*—Eyes bare, contiguous, or sub-contiguous in male; arista plumose; abdomen mostly oval, and always unspotted; alulets well developed, the under scale being much longer than the upper one; anal vein not prolonged to the margin of the wing.

*With legs wholly black.*

- |                                                |                     |
|------------------------------------------------|---------------------|
| ↘ 1. VESPERTINA, Fall.<br>2. NIGRITELLA, Zett. | 3. ALLOTALLA, Meig. |
|------------------------------------------------|---------------------|

*With legs partly pale.*

- |                                                                                                             |                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| ↘ 4. URBANA, Meig.<br>↘ 5. ANGELICE, Scop.<br>6. TINCTA, Zett.<br>↘ 7. PAGANA, Fab.<br>8. NIGRICOLOR, Fall. | 9. IMPUNCTA, Fall.<br><i>indistincta</i> , Rond.<br>10. SEPARATA, Meig.<br>11. FLAVEOLA, Fall.<br><i>rarians</i> , Zett. |
|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|

The species placed in this group form part of the genus *Spilogaster* of most authors, but differ from those properly belonging to that genus by having unspotted bodies. The genus *Mydæa* is closely related to *Hydrophoria*, but may be distinguished from it by the species having the abdomen usually oval and not conical, and not having the anal vein prolonged to the posterior margin of the wing.

M. NIGRITELLA, Zett.

This little black and rather rare species bears a very considerable resemblance

to the common *M. respectata*, but differs by having the abdomen narrower and more elongated; the halteres black, not yellow; the wings clear, not blackened; the posterior tibiae ciliated along both sides, not bare; and furnished with a single strong spine at the end, on the inner side.

#### *M. ALLOTALLA*, Meig.

This is rather an aberrant species, the generic position of which is somewhat doubtful; by the shape of the abdomen it resembles a *Hydrophoria*, but the anal vein is not prolonged to the border of the wing. It seems to be rare, or rather local.

#### *M. URBANA*, Meig.

In one variety of this common species the males have the anterior femora pale like the females, without any black colour, even at their bases.

#### *M. ANGELICÆ*, Scop.

It is almost impossible to distinguish this species from *M. urbana*, which it closely resembles, by the description of the older authors. Meigen described it as having both scutellum and abdomen ferruginous, and evidently confused it with quite a different species. Fallén, Zetterstedt, and Schiner, chiefly distinguish it from *M. urbana* by the external transverse vein of the wings being more upright than in that species; this character, however, is quite insufficient, and it remained for Rondani to point out a true characteristic difference. He noticed that in *M. angelicæ* the penultimate or third abdominal segment was crossed in the middle of the dorsum by a transverse row of strong bristles, in addition to the row on the distal margin; while in *M. urbana* the middle or disc of the same segment is without distinct bristles. Besides this character, the arista has much shorter hairs in *M. angelicæ* than in *M. urbana*; the external transverse vein is much less oblique; the fore femora in the females are partially blackened at their bases, and not wholly yellow as in *M. urbana*. Rondani says that the size of the former is rather less than that of the latter species.

This fly is decidedly rare in England. I have only seen one female, which I captured in September, 1878, at Clapham-in-Craven, Yorkshire.

Among some unarranged British *Diptera* collected many years ago, I find a single male of an apparently new species of *Mydæa*, related in some points to *M. angelicæ* and *M. urbana*. It is more elongated in shape and rather larger than either of these species; the penultimate abdominal segment is furnished both on the disc and margin with numerous long setæ, irregularly arranged; the longitudinal dorsal abdominal stripe is wider and more maculiform; and the legs have peculiarly long tarsi. Unfortunately, it is too imperfect for accurate description, the terminal joints of the antennæ being absent, as well as both the anterior legs.

#### *M. SEPARATA*, Meig.

This species closely resembles *M. impuncta*, but differs in having the basal joints of the antennæ and the palpi black, and not pale as in the latter species; the arista has also rather shorter hairs; and the eyes in the male are rather wider apart. It is rare.

#### *M. FLAVEOLA*, Fall.

This species closely resembles *Hyetodesia pallida*, but the eyes are bare and not hairy, and the arista has shorter hairs. The females of this species are not uncommon, but the males are seldom met with.

(*To be continued*).





# ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(continued from page 28.)

## 4. SPILOGASTER, Macq.

*Gen. ch.*—Eyes bare, contiguous or sub-contiguous in male; arista plumose or sub-plumose; alulets well developed, the lower scale always longer than the upper one; abdomen mostly conical, and always spotted; anal vein not prolonged to the margin of the wing.

### Sect. 1—*Legs entirely black.*

- |                                                |                            |
|------------------------------------------------|----------------------------|
| 1. NIGRINERVIS, Zett.                          | 4. QUATUOR-MACULATA, Fall. |
| 2. MACULOSA, Meig.<br><i>sigillata</i> , Rond. | 5. DUPLICATA, Meig.        |
| 3. NOTATA, Fall.                               | 6. DUPLARIS, Zett.         |

### Sect. 2—*Legs partly pale.*

- |                                                                                                 |                                                                                            |
|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| 7. COMMUNIS, Desv.<br><i>cæsia</i> , Macq.                                                      | 9. DEPUNCTA, Fall.<br><i>modesta</i> ?, Meig.                                              |
| 8. QUADRUM, Fab.<br><i>anceps</i> ?, Zett.<br><i>calceata</i> ?, Rond.<br><i>supera</i> ?, Wlk. | 10. FLAGIPES, Rond.<br>11. ULIGINOSA, Fall.<br>12. CONSIMILIS, Fall.<br>13. FUSCATA, Fall. |

This genus contains several species which are very difficult to determine, they being so closely related, that it is almost impossible to separate them by distinct points of structure. This remark may be applied to the males, but it is still more applicable to the females; some of which, as R. Desvoidy pointed out in his remarks on his genus *Mydina*, are so different both in form and colour from those of the opposite sex, that it is very difficult to know to what species they belong, unless the two sexes are found together. On this account, it is not easy to draw up a correct list of species; I have, however, carefully examined all the specimens I have seen, and if I have erred, I believe it will be on the side of making too few rather than too many species.

*S. MACULOSA*, Meig.

*S. NOTATA*, Fall.

These two species bear a great resemblance to each other, and are often mixed together in collections; but they may be distinguished from each other by the following differences of character. The former is generally rather larger and more elongated in shape than the latter; the arista is shorter haired in *S. maculosa* than in *S. notata*, though it is not very long haired in either species; the scutellum has a black spot on either side in *S. maculosa*, but only one central black mark at the

base in *S. notata*; the 4th and 5th longitudinal wing veins are parallel, or slightly divergent at their extremities, in *S. maculosa*, while the 5th vein converges a little towards the 4th at its extremity in *S. notata*. The former is the more common species.

#### S. 4-MACULATA, Fall.

This may be distinguished from all of the three following species, to each of which it bears considerable general resemblance, by the following points of structure: it has the arista shorter haired; it has only three dorsal thoracic bristles behind the transverse suture in the row between the middle and lateral black stripes instead of four; and the posterior tibiæ are furnished with a number of long hairs on their inner sides, which are absent in the others. This species is not very common.

#### S. DUPLICATA, Meig.

Several different but very closely allied species have been confounded together under this name. Meigen says, "this species differs manifoldly in colour, size and design;" which remark evidently shows that he included more than one species under the same designation. I find three very distinct though closely allied species, which may be named *duplicata*, *duplaris*, and *communis*; the last will come under the second section, as the legs are partly pale.

I shall briefly describe the first species, and then point out how the two others differ from it.

*S. duplicata*: colour grey; eyes of male sub-contiguous; forehead and face very slightly prominent; antennæ rather short; arista long haired; thorax with four longitudinal black stripes (the outer of which are interrupted at the suture) placed rather close together, and sometimes rather indistinct; four dorsal bristles behind the suture; scutellum marked with a fugitive brown spot at the base; abdomen narrow and conical, whitish-grey, with four black spots, two on the second and two on the third segment, which vary in size and shape, being sometimes round and sometimes square or triangular; in some specimens, an indistinct longitudinal dorsal stripe is also present between the spots; wings clear with black veins, which are sometimes slightly clouded; external transverse vein mostly straight, but more or less oblique; internal transverse vein placed over the discoidal cell at about two-fifths from its end; costal spine distinct; calyptra yellowish-white; halteres yellow; legs black; posterior tibiæ thickly clothed with short hairs on both sides, and having several strong bristles of uneven lengths on their outer surfaces. The female has the eyes widely separated by a grey-coloured frontal space, having a bifurcated black mark in the fore part. The external transverse veins are usually less oblique than in the male, and the posterior tibiæ have a slight rufous tinge; in other respects it closely resembles the male.

Length of ♂ and ♀, 2 to 2½ lines.

The late Professor Rondani to whom I sent some specimens for his inspection, said that in his opinion it was the *S. duplicata* of Zetterstedt, but not that of Meigen. This species is not uncommon, I have found it upon the ground on pathways in fields.

#### S. DUPLARIS, Zett.

This species differs from *S. duplicata* by being rather larger and stouter in shape; by having the abdomen more oval; by the absence of the brown mark at the base of the scutellum; by the lines on the thorax being narrower and more distinct;

by the external transverse vein of the wings being less oblique; and by the internal transverse vein being placed very slightly behind the centre of the discoidal cell, which may be considered as the most characteristic point of distinction. I am not acquainted with the female of this species, and it is not described by Zetterstedt. The specimens which I have named *duplaris* differ in some respects from the description given of that species by Zetterstedt, so I am not certain that they are identical with those he described. Rondani, to whom I sent this fly, together with the last, said that he considered I had rightly named it *duplaris*, Zett. ("talem esse cogito"). This species is not common. The only specimens which I have seen were captured in the neighbourhood of Edinburgh.

#### S. COMMUNIS, Desv.

In general colour, form, and design, this species closely resembles *S. duplicata*, but it is generally rather larger, and always has the tibiæ more or less tinged with red or yellow. The females usually have the legs much paler than those of the other sex, but the middle and posterior tibiæ are sometimes quite testaceous, even in the males, though in the most common variety the legs are so nearly black, that the red tinge, which is then confined to the posterior tibiæ, may easily be overlooked, and this species may then be confounded with *S. duplicata*.

Macquart only knew the male, which he named *S. cæsia*. His description is good though short, and applicable to the black-legged variety; for he says, "Pieds noirs; jambes quelquefois d'un testacé noirâtre." R. Desvoidy described this species (especially characterizing the female) under the name of (*Mydina*) *communis*, which name I have adopted, as it has the priority over that of *cæsia*, and is also very appropriate, from the general diffusion and abundance of this fly. Apart from the different colour of its legs, *S. communis* differs from *S. duplicata*, in the males, by having the lines on the thorax usually more distinct; the external transverse veins of wings more oblique, and often more clouded, as well as sometimes sinuous; by the internal transverse vein being placed further back, being about one-third from the end of the discoidal cell, instead of two-fifths; by the antennæ having the third joint rather longer in proportion; and by the calyptæ being yellower and having the lower scale rather smaller than in *S. duplicata*. The females of *S. communis* cannot easily be confused with those of *S. duplicata*. They differ from the males of their own species, by having the thorax often indistinctly marked with the lines brown instead of black, and the spots on the abdomen small and also brown. The external transverse veins are also often much less oblique (this character varies much in both sexes), and the legs have the tibiæ and knees, as well as the ends of the femora, of the middle and posterior pairs, mostly distinctly testaceous, with a rufous tinge on the bases of the anterior tibiæ.

#### S. QUADRUN, Fab.

This is a very difficult species to define. It closely resembles some of the pale-legged varieties of *S. communis*, and I know of no decided characters by which the females of the two species can be separated. The males differ by the eyes being rather more widely separated in *S. quadrum* than in *S. communis*; by the thorax being less distinctly striped (sometimes almost unstriped) in the former than in the latter; by the wings in *S. quadrum* being tinged with yellow at their bases; being

without costal spine; having the external transverse vein straighter and less oblique than in *S. communis*; and the internal transverse placed nearer to the centre of the discoidal cell. The middle femora in *S. quadrum* are furnished with bristles along their whole under-surface, while in *S. communis* a few long bristles only are found near the base. This is not a common species.

#### S. DEPUNCTA, Fall.

In this species the basal two joints of the antennæ are often pale; the palpi are also generally rufous, though Rondani says they are black at the apex and red internally. This species may be recognised by having only three posterior dorsal thoracic bristles behind the suture, while there are four in all the other species that I know in this genus, with the exception of *S. 4-maculata* and *S. fuscata*.

#### S. FLAGIPES, Rond.

The males of this species closely resemble those of *S. depuncta*; but differ in being rather larger; in having four instead of three posterior thoracic dorsal bristles; and especially by having several very long straggling hairs or bristles on the outer sides of the posterior tibiæ; by the presence of which this rather rare fly may at once be recognised. I have not seen a female.

#### S. CONSIMILIS, Fall.

This species has the arista furnished with such short hairs, that it was placed by Schiner in the genus *Limnophora*; it has, however, all the characters of a *Spilogaster*.

#### S. FUSCATA, Fall.

This is an aberrant species, which differs from all the others in the genus by having only three central triangular spots, placed longitudinally on the dorsum of the abdomen, instead of two lateral ones on each of the middle segments, as in the other species. It is rare in England.

(To be continued).

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## ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(continued from page 65.)

## 5. LIMNOPHORA, Desv.

*Gen. ch.*—Eyes bare, contiguous or approximate in the males; arista slightly pubescent or bare; abdomen oval or conical, and always marked on the dorsum with four or six large triangular or sub-quadrate spots; alulets well developed, the under scale being longer than the upper; anal vein not reaching the margin of the wing.

1. COMPUNCTA, Wdm.

3. TRIANGULIGERA, Zett.

2. SORORCULA, Zett.

4. CONTRACTIFRONS, Zett.

5. SEPTEMNOTATA, Zett.

Several species of a widely different character have been included in this genus, which are only related to each other by having a very short-haired or nearly bare arista, and spotted bodies. Some of these, as *M. consimilis*, Fall., *M. litorca*, Fall., and *A. pertusa*, Meig., belong to the genus *Spilogaster*; while others, as *M. riparia*, Fall., and *M. triangula*, Fall., must be placed in the *Cænosiæ* group, the eyes being widely separated in both sexes. I have thought it better to restrict the name *Limnophora* to a small and natural tribe, of which *A. compuncta*, Wdm., is the type. All in this group are of a black colour, with entirely black legs; more or less fuliginous wings; and with the second and third (and sometimes the first) abdominal segments each marked on the dorsum with two large triangular or sub-quadrate lateral spots, separated from each other by a straight, longitudinal, narrow grey stripe.

The species are mostly confined to the northern and mountainous parts of Europe, being more common in Scotland than in England; and on the continent, finding their chief home in Scandinavia.

## L. COMPUNCTA, Meig.

Of this, the largest species in the genus, I have not seen an English specimen; but several were given me some years ago by Mr. Verrall, which had been captured by him at Rannoch in Scotland.

## L. TRIANGULIGERA, Zett.

I captured several males of this species on the borders of Loch Katrine, in August, 1874, where it seemed abundant.

## L. CONTRACTIFRONS, Zett.

Zetterstedt has described several species which are so closely related to each

other, that it is very difficult to define them accurately. I have referred a single specimen to the present species, which I found in June, 1880, on very high ground on the borders of Rombald's Moor in Yorkshire.

### L. 7-NOTATA, Zett.

This pretty little fly is the only one in the genus which is widely diffused, or at all common in England. I have found it both in Yorkshire and in the south. All the male specimens which I have seen belonged to the *b.* var. of Zetterstedt, having the alulets fuscous; a female which I captured together with a male in Askham Bog, near York, in September, 1880, had the alulets white, while those of the male were black.

### 6. HYDROPHORIA, Desv.

*Gen. ch.*—Eyes bare, contiguous or sub-contiguous in male; arista plumose or sub-plumose; alulets of moderate size, with the lower scale longer than the upper; abdomen conical, without distinct spots, and with projecting sub-anal appendages in male; anal vein prolonged to posterior margin of wing.

#### Sect. 1—*Legs entirely black.*

- |                   |  |                   |
|-------------------|--|-------------------|
| 1. AMBIGUA, Fall. |  | 2. DIVISA, Meig.  |
|                   |  | 3. CAUDATA, Zett. |

#### Sect. 2—*Legs partly pale.*

- |                          |  |                      |
|--------------------------|--|----------------------|
| 4. CONICA, Wdm.          |  | 6. LINOGRISEA, Meig. |
| 5. BRUNNEIFRONS, Zett.   |  | 7. ANTHOMYIEA, Rond. |
| <i>coronata</i> ?, Zett. |  | 8. SOCIA, Fall.      |

This genus is closely allied both to *Mydæa* and *Hylemyia*. It differs from the former by the species having the anal vein prolonged more or less distinctly to the margin of the wing, and by the abdomen being usually conical rather than oval, and furnished beneath in the males with large sub-anal appendages. It is distinguished from *Hylemyia*, to which it has been united by Schiner, by its higher degree of organization; the alulets in the principal species being of considerable size, and always with the scales of unequal length; while in *Hylemyia* they are small, and the lower scale is always covered by the upper one; the abdomen also in the latter genus is usually cylindrical rather than conical.

#### H. AMBIGUA, Fall.

#### H. DIVISA, Meig.

These species have been confounded together, though they are really very distinct. This confusion has arisen from their bearing a good deal of general resemblance, and from having been too briefly and imperfectly described; so that the description of one will apply almost as well to the other. Fallén's *H. ambigua* is apparently more rare than Meigen's *H. divisa*, though neither is common.



They may be distinguished by the following characteristics: the face is more prominent in *H. ambigua* than in *H. divisa*, and of a more brilliant silvery-white colour; the three longitudinal broad black stripes present on the thorax of both species, are separated by much more distinct white interspaces in *H. ambigua* than in *H. divisa*; and the sides of the thorax are of a more brilliant shining white colour in the former than in the latter. The scutellum is grey, with the apex shining black, in *H. ambigua* while it is of an uniform grey colour in *H. divisa*. The abdomen has a longitudinal black dorsal stripe in both species, but it is much wider in *H. ambigua* than in *H. divisa*, and of nearly equal width in its whole length, extending over each segment to the apex. In *H. divisa* it is moderately wide over the first segment, but gradually becomes narrower, and terminates in a fine line, or becomes indistinct, at the hinder margin of the third segment. The apex of the abdomen is shining black in *H. ambigua*, but grey in *H. divisa*. The sub-anal appendages are very different in the males of the two species, affording very characteristic points of distinction; in *H. ambigua* they form a large projecting complicated hairy mass, under the third and fourth abdominal segments; while in *H. divisa* there are two long brown horny lamellæ, extending forward from the under-surface of the apex, and covering the rest of the male organs, which are much smaller and less hairy than in the former species. The third and fourth longitudinal veins of the wings slightly diverge from each other in *H. ambigua*, while they run quite parallel to each other in *H. divisa* as they approach the margin. The posterior tibiæ are ciliated on their outer and posterior surfaces with a number of long and short bristles of uneven lengths in *H. ambigua*, while in *H. divisa* there is a row of very short stiff hairs of equal lengths, extending along the whole outer surfaces of the tibiæ, and three long bristles in addition, one placed in the centre and one at each extremity of the tibia.

#### H. CAUDATA, Zett.

This species may be known from either of the preceding by its having two lateral tufts of hair, one on each side of the anus, on the under-surface, and another central tuft at the end of a projecting process, placed in front of the large hairy genital protuberance, beneath the penultimate abdominal segment. The abdomen is marked in the same way on the dorsum as in *H. ambigua*, but is more hirsute. The posterior tibiæ are armed as in *H. divisa*.

I captured several males of this species in 1874 on the margin of Lake Windermere; I have not met with it in any other locality.

#### H. BRUNNEIFRONS, Zett.

The female only of this species has been described; neither Zetterstedt nor Rondani knew the male. I found one female at Silverdale, Lancashire, in May, 1881, and have another which I found in a collection of *Diptera* made by the late F. Walker.

#### H. ANTHOMYIA, Rond.

This well-marked and pretty species has not been noticed by any author except Rondani, who found it rarely in Italy. Herr Kowarz has met with it in Austria, and it is generally diffused and by no means rare in England; so it probably occurs in other parts of Europe, but has been overlooked.

It differs from all the other species in this genus by having the sides and under-surface of the two basal segments of the abdomen more or less testaceous in colour, and slightly translucent. The abdomen is cinereous, and has a longitudinal, tapering, black dorsal stripe, as well as a series of transverse black marks at the base of each segment, which are dilated on each side of the central stripe, so as to form six semi-lunar-shaped spots. The legs have the femora and tarsi black in both sexes, and all the tibiae more or less testaceous. In some varieties the legs are almost black, and the yellow tinge at the base of the abdomen also indistinct.

The sub-anal appendages of the males are very complicated. Two long horny processes, with sharp points, extend forward from the under-surface of the anal segment, which are furnished with tufts of black hairs in the middle; they sometimes project downwards, the points being free and erected; at other times they are folded under two other membranous lobular bodies, which are placed under the penultimate segment and extend backwards.

## H. SOCIA, Fall.

This is an aberrant species, the generic position of which is rather difficult to determine; the arista being short-haired, and the abdomen oval and depressed. Rondani (the latest authority on the *Anthomyiidae*\*) placed it first in the genus *Anthomyia*, but afterwards removed it into the present one, to which it certainly belongs. It is not common.

(To be continued). *Liburnia V. flavola*, 1851

## ON CERTAIN BRITISH HEMIPTERA-HOMOPTERA.

BY JOHN SCOTT.

(Continued from p. 67).

### LIBURNIA V-FLAVA, sp. nov.

♂. Yellow. *Crown* yellow, as long as broad from in a line with the anterior margin of the eyes to the base, anterior margin rounded, next the basal margin a distinct fovea on each side adjoining the eyes, the triangular space in front between the keels reaching to the frons: *face* yellow, slightly dilated below the eyes: *antennae* yellow, 2nd joint granulated.

*Pronotum* yellow, with a distinct but minute fovea in the centre on each side of the central keel, posterior margin arcuate: *scutellum* yellow, somewhat depressed at the base on each side of the central keel. *Elytra* yellow, reaching to the apex of the 6th abdominal segment, apex broadly rounded, nerves not granulated. *Legs* yellow: *claws* black.

*Abdomen* yellow: genital segment yellow, posterior margin viewed from the side nearly straight, viewed from behind broadish-oval, appendage yellowish-white, somewhat semi-oval, lower margin concave, upper margin inwardly on each side of the tube, and the lower angles very narrowly, black; processes yellow, V-shaped, upper margin narrowly margined with black and produced into a short tooth interiorly.

Length, 1 line.

♀. Unknown.

This species stands between *L. flavicola*, Flor., and *L. concolor*, Fieb. From the former it is easily distinguished by the different form of the

\* Dipterologiae Italicae prodromus, vol. vi. Parma, 1877.

## ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(continued from page 104.)

## 7. HYDROTEA, Desv.

*Onodontha*, pt., Rond.

*Gen. ch.*—Eyes either hairy or bare, contiguous or sub-contiguous in males; arista pubescent; alulets well developed, with unequal scales; abdomen mostly oval; wings with anal vein not prolonged to the margin, and with third and fourth longitudinal veins mostly curved slightly towards each other at their apices; legs with anterior femora of males always toothed at their extremities, and fore tibiæ attenuated or notched at their bases.

Sect. 1—*Eyes hairy.*

- |                                 |                           |
|---------------------------------|---------------------------|
| 1. CILIATA, Fab.                | 3. CYRTONEURINA, Zett.    |
| <i>spinipes</i> , Fall. & Zett. | <i>silvicola</i> , Loew.  |
| 2. OCCULTA, Meig.               | 4. IRRITANS, Fall.        |
|                                 | <i>dentimana</i> ?, Meig. |
|                                 | <i>meteorica</i> , Macq.  |

Sect. 2—*Eyes bare.*

- |                            |                                |
|----------------------------|--------------------------------|
| 5. DENTIPES, Fab.          | 9. ARMIPES, Fab.               |
| 6. PALESTRICA, Meig.       | <i>floccosa</i> , Macq.        |
| 7. RONDANII, <i>sp. n.</i> | 10. FASCICULATA, <i>sp. n.</i> |
| 8. METEORICA, Lin.         | <i>armipes</i> ?, Macq.        |

Rondani separated the species of this genus which have hairy eyes from the others, and placed them in a separate genus, which he named *Onodontha*; and I formerly adopted his arrangement, but there are no other characters by which the separation can be supported, and in the most common species of this group, viz, *H. irritans*, which Rondani retained in the old genus, the eyes of the males are always more or less pubescent or short haired, so it is far better to keep them all together. The species are not numerous, and are united by strong natural characters, the fore legs of the males being always toothed, and the middle and hind ones often furnished with peculiar spines or tufts of hair.

## II. CYRTONEURINA, Zett.

This species bears a strong general resemblance to *H. dentipes* and its congeners, having the third and fourth longitudinal veins of the wings convergent (whence its name); but it may at once be distinguished from *H. dentipes* by the eyes being distinctly haired. It appears to be a rare British species, as I have only seen one which was sent to me by C. W. Dale, Esq., of Glanvilles Wootton, Dorset, for inspection.

## H. IRRITANS, Fall.

This common species abounds everywhere in England; the females swarming in woody places, especially in warm damp weather, when they cause much annoyance both to horses and men. Macquart confounded this species with the *M. meteorica* of Linnæus, which is a very different and much less common species, at least in Britain. *H. irritans* may be distinguished from all the other species in this genus by having the arista sub-plumose (not merely tomentose); the middle metatarsi of the males pectinated beneath with thick-set strong bristles; and the posterior tibiæ (which, as well as the posterior femora, are somewhat elongated and curved) ciliated at the apices with a small tuft of soft hairs.

## ✓ II. DENTIPES, Fab.

This species, like the last, is exceedingly common; it is distinguished, together with the two following species (to both of which it is closely allied), from the others

Fig. 2.



in this section by having the extremities of the third and fourth longitudinal veins of the wings strongly convergent (Fig. 2). The males of *H. dentipes* may also be known from the others by the posterior tibiæ being somewhat curved, and furnished at their apices on the inner sides with a callosity or tubercle covered with short adpressed hairs; the anterior tibiæ also are ciliated with a small tuft of hairs on their under-surfaces toward their fore part; the middle tibiæ are armed along their whole external surfaces with a number of very minute erect bristles of even lengths, arranged irregularly in several rows, giving a peculiar appearance under a powerful lens, as if the side of the limb was covered with a "chevaux de frise;" and lastly, the abdomen is tessellated with white reflections.

## H. PALESTRICA, Meig.

This species, often confounded with the former, is rare, and has never been characteristically described. It bears a great general resemblance to *H. dentipes*, from which it differs in the following points: the posterior tibiæ are less curved, and have no callosity at the apex; the anterior tibiæ are without the tufts of hair on their under-surfaces; the middle tibiæ are ciliated along their outer sides with short curved hairs, which are not erect, but incumbent or imbricated over each other; and the abdomen is of an uniform grey colour, with a narrow dorsal stripe.

## II. METEORICA, Lin.

This little species, though abundant on the continent, is not of very common occurrence in England. The males are black, usually with fuliginous wings; have black halteres, and two rather long sharp teeth at the ends of the anterior femora.

## ✓ H. ARMIPES, Fab.

Two species have been mixed together under this name, but the true *armipes* may be distinguished from its congener, which I have named *H. fasciculata*, by the following characters: the anterior femora have two teeth on their under-surfaces, one much larger than the other, the smaller of which has been overlooked by most authors, with the exception of Macquart, who mentions it in his description of *H. floccosa*; there is a single long, straight, blunt spine (or rather bristle) in the middle

of the under-surfaces of the posterior femora, and the lower half of the inner surface of each posterior tibia is ciliated with longish soft hairs extending to the apex, which commence by a tuft or loose pencil of hairs much longer than the others in the middle of the limbs. This is a common species.

### H. RONDANI, *sp. n.*

*Mas., niger nitidus, abdomine oblongo-ovato fusco-cinereo non tessellato; linea longitudinali lata nigra; oculi nudi sub-remoti; alæ sub-fuscae, venis longitudinalibus 3<sup>to</sup> et 4<sup>to</sup> versus apices paulo inflexis; femora antica bidentata.*

*Long. 3½ lin.*

*Head:* eyes bare and separated by a wide black stripe, which occupies about one-seventh of the width of the head; arista pubescent at the base, which is thickened.

*Thorax* with *Scutellum* black, shining, and unstriped.

*Abdomen* of a brownish-grey colour, without white reflections, and having a wish black longitudinal stripe down the middle of the dorsum, of an even width over each segment, though slightly evanescent on the last; genital appendages forming a small cylindrical projection underneath.

*Wings* short, of an uniform yellowish-brown colour; internal transverse veins exactly opposite the ends of the axillary veins; external transverse veins sinuous, and slightly oblique; third and fourth longitudinal veins slightly convergent at their extremities, but less so than in *H. dentipes*.

*Calyptra* rather small (less than in *H. dentipes*) and yellowish-brown. *Halteres* with the stem tawny and the knob blackish-brown.

*Legs* black; anterior femora with two teeth on their under-sides near their apices, the inner of which is about twice as long as the outer; anterior tibiæ narrowed at the base, slightly notched (less so than in *H. dentipes*), and without peculiar cilia; middle femora bearded on their under-sides at the base with a tuft of black hairs as in *H. dentipes*; middle tibiæ ciliated along the whole length of their outer sides with a series of short curved hairs or bristles of even length, imbricated over each other, and having in addition three long strong bristles on their lower halves; there are also three or four shorter bristles on the posterior sides of the same limb; posterior tibiæ attenuated at the base, and without callosities at their inner extremities, slightly curved, and ciliated along their outer surfaces with soft hairs, which become gradually longer towards the apex; there are also several long bristles on the posterior surfaces at the lower ends.

The female is unknown to me.

This species bears a very close resemblance to *H. palastrica*, but differs in being smaller and darker in colour, in having shorter and browner wings; a rather wider frontal space between the eyes; and a much wider longitudinal dorsal stripe on the abdomen. It appears to be rare, as I have only seen one specimen, which I captured near Bicester, Oxon, in June, 1880.

### II. FASCICULATA, *sp. n.*

*Mas., niger nitidus pilosus; abdomine ovato albo cinereo, linea longitudinali nigra, segmento secundo dilatata signato; oculi coherentes nudi; femora antica unidentata; femora postica sublis setis duabus contiguis medio instructa; tibiæ posticae setulis tribus longis formæ penicilli rigidi ornatae.*

*Long. 2 lin.*



*Head*: eyes contiguous, naked; arista almost bare; face silvery-white, very slightly prominent.

*Thorax* shining black, unstriped, having four bristles behind the suture in each medio-lateral row; sides setose. *Scutellum* black.

*Abdomen* ash-grey, ciliated with long soft hairs on both edges and middle of segments; first segment black at the base, from which extends a longitudinal black stripe down the dorsum, which is dilated into a triangular black spot on the second segment, the apex of the triangle being backwards, and ending in a narrow line passing over the third and fourth segments; anal appendages small and shining black.

*Wings* hyaline; transverse veins rather near together; external one slightly oblique, and a little sinuous; third and fourth longitudinal veins running almost parallel to each other towards the apex.

*Calyptra* yellowish-white. *Halteres* dingy yellow.

*Legs* black; anterior femora with a single sharpish tooth on the under-surface near the end; anterior tibiæ narrowed at the base, and with the lower two-thirds thickened and shortly ciliated on posterior surfaces; middle femora armed on under-surfaces near the base with two or three strong blunt bristles; middle tibiæ furnished along the whole of their external surfaces with numerous minute erect spines, somewhat similar to those found in *H. dentipes*; posterior femora with two straight blunt hairs, placed near to each other, on the under-surface, exactly in the middle; posterior tibiæ with a small rigid pencil of about three long hairs, converging to a point on their anterior surfaces a little before the middle; a few short soft hairs are placed on both inner and outer surfaces near the apex.

I do not know the female.

This species bears a very close general resemblance to *H. armipes*, with which it has evidently been confounded. Zetterstedt says in his description of the latter, "variat ♂ femoribus posticis subtus in medio setulæ geminæ." Besides the points of distinction which I have mentioned between these two species, I may add that the poisers are fuscous in *H. armipes*, and yellow in *H. fasciculata*; the wings are slightly brown in *H. armipes*, and almost white in *H. fasciculata*; and lastly, the anterior tibiæ are slightly bearded with some long hairs on their under-surfaces in *H. armipes*, while they are only ciliated with short hairs in *H. fasciculata*.

This little fly is generally distributed.

(To be continued).

W. L. J. 172. 14621

#### NOTES ON TENTHREDINIDÆ.

BY J. E. FLETCHER.

The ♂ of *Hemichroa alni* has hitherto been reputed very rare. My experience of the species is very limited, as I have bred only nineteen specimens, four in August, 1880, and fifteen in May last; but of these, two of the former, and eight of the latter were ♂—thus outnumbering the ♀ by one.



skin though dull is yet clear enough to show a darker dorsal pulsating line, the shining head, and plate with a wide behind dorsal division are of lightish warm brown, both dotted and marked with darker brown, mouth blackish, the shining spots on the back and sides, each bearing a hair, are of a darkish warm brown on the back, lighter brown on the sides, the small round spiracles are black, the anterior legs ringed and tipped with darkish brown, the ventral legs fringed with dark brown hooks: when full-fed and about to spin up, the colour of the skin changes to a pale pinkish-brown.

The pupa is enclosed in an oval cocoon half an inch long and quarter of an inch wide, made with similar materials to those of the gallery, but is more tough and stronger and sunk partly in the earth; the pupa itself is three-eighths of an inch long with no peculiarity of shape, with longish wing covers, leg-and antenna-cases, the tapering abdomen ending in a short truncated projection, the spiracles rather prominent; the colour at first is pale yellowish-brown and shining, changing to dark brown a little before the insect is disclosed.

Emsworth: *September 30th, 1881.*

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#### LIFE HISTORY OF *DEILEPHILA SPINIFASCIA*, BUTLER.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

The larvæ of this fine species were abundant in the neighbourhood of Valparaiso at the end of 1872 and beginning of 1873, and as they were of all sizes, and ova were to be found throughout October, November, December, and January, the probability is that there is a succession of broods throughout the year. Their food-plant, *Muhlenbeckia injucunda*, called by the Chilians the "Quilo," grows in profusion all over the country, and in some places inland becomes a large straggling plant of vigorous growth, often entwining itself among other shrubs and attaining a considerable height, but immediately on the coast-line it never grows to any great size. The parent moths usually select small stunted scrubby bushes, growing in exposed places, whereon to deposit their eggs. The eggs hatched in the course of a week or ten days. The young larvæ were exceedingly beautiful creatures, but after their last change they were by no means so handsome, and, moreover, at that age varied very considerably. Before undergoing their last moult they were as difficult to sketch or describe as the larvæ of *Deilephila euphorbiæ*, but the following description will give a pretty fair idea of what they were then like. Ground-colour deep velvety-black; on fifth to eleventh segments inclusive there is a pale yellow ocellated spot, having a pink centre, and this

spot is enclosed by an intensely black perpendicular stripe which runs from the dorsal to the spiracular line; behind this, on each segment, there are five alternate golden-green and black perpendicular stripes, the first being three times the width of the other four; dorsal stripe rather broad and pale pinkish-yellow; spiracular stripe as wide as the dorsal and bright red; spiracles small and yellow; under-surface dark olive-green thickly dotted with yellow spots; head, prolegs, and claspers dull red; horn dull red with a black tip; the dorsal stripe runs through the horn to the extremity of the anal claspers where it is bordered on each side with deep black.

The full grown larvæ (which are as large as those of *Sphinx ligustri*) as I have mentioned before, vary exceedingly, hardly two being alike, but the following was perhaps the most usually met with and typical form. Ground-colour olive-green; dorsal stripe broad and pink; sub-dorsal line pink enclosing from fifth to eleventh segments a bright red ocellated spot with shining black pupil; just below the spiracles, which are pink, is another interrupted stripe of the same colour; under-surface, which is somewhat wrinkled, dark olive-green thickly spotted with yellow; head, prolegs, and claspers pink; horn rough, pink with a black tip.

The following is a description of four of the varieties:—

*Var. A.*—Whole of the upper-surface dull black; ocellated spots pale pink with intensely shining black pupils; dorsal stripe narrow and red; an interrupted sub-dorsal stripe from the second to fifth segment, where it merges into the ocellated spot; behind each ocellated spot are two small faint pink spots indicating a continuation of the sub-dorsal stripe; skin-folds on each side of the face much wrinkled and pale yellow; spiracles pale straw-colour, and beneath them runs a broad interrupted pink stripe; under-surface blackish-green spotted with yellow; head, prolegs, and claspers dull red; on the twelfth segment there is an oblique pinkish stripe; above the anal claspers there are two oval pink spots; horn dull red with black tip. This was a common variety.

*Var. B.*—Whole surface pale olive-pink; ocellated spots straw-colour, with black pupils, and bordered outside with black; head pale olive-green; dorsal stripe broad and pale pink; sub-dorsal line of the same colour, but so faint as to be scarcely perceptible; spiracles orange in a black ring; spiracular line very faint and pink; prolegs and claspers bright pink; horn pale blue.

*Var. C.*—Ground-colour olive-brown; dorsal stripe very broad and of a clear straw-colour; sub-dorsal line pink and much interrupted; ocellated spots with intensely black pupils, bordered by a narrow ring

# ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(continued from page 126.)

## 8. DRYMEIA, Meig.

*Gen. ch.*—Eyes bare, sub-contiguous in males; antennæ short, with sub-plumose arista; peristome and cheeks bristly; proboscis elongate, horny, and with a moveable, pointed, hook-like apex; abdomen oblong and hairy; alulets moderately developed, with unequal scales; wings with anal vein not prolonged to the margin; legs spinous.

*D. HAMATA*, Fall.

*obscura*, Meig. and Macq.

Of this peculiar genus with its elongated hooked proboscis, only one European species is known. I am not aware whether any exotic species have been described, but in a collection of North American *Anthomyiidae*, which I received in 1876 from the Museum of Natural History, in Cambridge, Mass., for inspection, through the kindness of Baron R. Osten-Sacken, I found several specimens of a species closely related to *D. hamata*, but rather smaller.

## 9. POGONOMYIA, Rond.

*Gen. ch.*—Eyes bare, sub-contiguous in males; antennæ short, second joint armed with long bristles; arista sub-pubescent; peristome thickly bearded with bristles; proboscis of ordinary form; abdomen oblong, and hairy in the males, especially at the apex; alulets of moderate size, with unequal scales; wings with anal vein not reaching the margin; legs bristly.

*P. ALPICOLA*, Rond.

Rondani formed this genus for a single alpine species, which bears a strong general resemblance to *Drymeia hamata*, but differs essentially from that fly by the absence of the hooked proboscis. *P. alpicola* is shining black, about 3 lines in length, with fuscous wings, black poisers, hairy body and legs. Rondani only knew the male; the female differs from it in having the eyes separated by a frontal space, occupying nearly a third of the width of the head; this space is of a deep velvety black colour, bordered on each side by a narrow whitish margin, in which is seated a single row of strong bristles, extending to the base of the antennæ. The ocelli are seated on an oval spot, the front part of which glistens with silvery-white reflections; there is also a well-marked, triangular, silvery-white spot between and over the bases of the antennæ (this spot also exists in the male, though of a smaller size). The peristome is nearly smooth, and the body and legs less hairy than in the male. The abdomen is conical and pointed at the apex. The colour is shining black, with cinereous reflections. The poisers are black, and the wings fuscous, but less deeply coloured than in the male, especially at their bases.

Like *Drymeia hamata*, *P. alpicola* is sluggish in its habits; it has not previously been recorded as British, nor mentioned I believe by any continental author except Rondani. At the end of June and in the beginning of July last (1881), I found both males and females in profusion in a field of mowing grass, on very high ground, at Queensbury, between Bradford and Halifax. The flies were all located in the corollæ of buttercups (*Ranunculus acris*), and allowed themselves to be captured by the hand. I have not met with them in, nor received them from, any other locality.

## 10. OPHYRA, Desv.

*Gen. ch.*—Eyes bare, large, contiguous or sub-contiguous in males; arista bare; abdomen oval, furnished with soft hairs, but without bristles; alulets large, lower scale much longer than upper; anal vein of wings not reaching the margin; posterior tibiæ mostly curved and ciliated; colour metallic steel-blue or black.

### 1. LEUCOSTOMA, Fall.      2. ANTHRAX, Meig.

The flies comprised in this small genus are characterized by their shining metallic colour. In their habit they resemble some of the true *Muscidæ*, as the *Lucilia*, &c. The first species is generally distributed; but the second (*O. anthrax*) is local, though occurring in great abundance in some places. The only locality in which I have seen it was at Buckingham, where it was swarming on a hedge near a bone mill, which emitted a strong putrid smell.

## 11. TRICHOPHTHICUS, Rond.

*Lasiops*, Meig. p.

*Gen. ch.*—Eyes hairy, and contiguous or sub-contiguous in males; arista sub-pubescent or bare; epistome sometimes prominent; alulets moderately developed, with unequal scales; anal vein not prolonged to the margin of wing.

- |                       |  |                          |
|-----------------------|--|--------------------------|
| 1. CUNCTANS, Meig. ♂. |  | 2. SEMIPELLUCIDUS, Zett. |
| innocens?, Zett. ♂.   |  | 3. PULCHER, sp. n.       |
| decolor, Fall. ♀.     |  | 4. ROSTRATUS, sp. n.     |

Meigen formed the genus *Lasiops* to include all those species of *Anthomyiidae* which have hairy eyes and a pubescent arista. His definition was so short and incomplete, that he grouped together several species belonging to quite distinct genera; and the genus *Lasiops*, as described in the 7th vol. of his great work, really includes only two characteristic species, for out of the five which he enumerates, one (*L. occulta*) is a *Hydrotæa*, another (*L. apicalis*) appears to be identical with *Hyctodesia semicinerea*, Wdm., and a third (*L. ænescens*) belongs to the genus *Lonchæa* among the *Acalypterata*.

Besides *L. cunctans*, Meig., and *L. hirticeps*, Fall. (the two species

left in Meigen's genus), there are several species which have been since discovered, with hairy eyes and bare arista, which cannot be placed in any of the other described genera; some of these are more highly developed than the others, having largish alulets with unequal sized scales, while some are of feeble organization, with small and equal sized scales. Rondani has placed the former group in his genus *Trichophthicus*, and reserved the name of *Lasiops* for the latter. This arrangement ought to be reversed, as Meigen's typical species (*T. cunctans*) should be retained in his own genus; but my friend, Herr Kowarz, having lately published\* an elaborate monograph on the species in the latter division, in which he has followed Rondani, I feel bound to do the same. I shall return to the restricted genus *Lasiops* when I have finished with the more highly organized genera.

### T. CUNCTANS, Meig.

This species, which is not uncommon in the North of England, appears to be very rare on the continent. Meigen imperfectly describes the male only, and mentions no habitat. Schiner gives a brief but correct description, stating that he had only seen a single male; and Macquart and Rondani do not allude to it. As I have found both males and females in the neighbourhood of Bradford, I will shortly mention the chief peculiarities of each; for though it is a very well-marked species, it is very imperfectly known.

The males have the eyes contiguous, and clothed with long hairs; the thorax is shining black, but in a strong light may be seen to be striped with four indistinct deeper black lines, the outer of which are broken at the transverse suture. The abdomen is clothed with soft hairs, and appears of a blackish colour when viewed from before backwards, but when looked at from the opposite direction, shines with whitish-grey reflections, and shows a widish, tapering, black dorsal stripe, with indistinct black posterior borders to each segment. The scales are yellowish, and the poisers black. The wings are slightly fuscous; the third and fourth longitudinal veins are parallel between the external transverse vein and the apex, the external transverse vein itself being obliquely placed, but straight. The legs are all black and clothed with soft hairs, but few spines; the posterior tibiae are ciliated with fine bristles, of moderate and even lengths, along the whole of their external surfaces.

The female has the eyes widely separated, and only slightly pubescent. The thorax and abdomen are both of a dull grey colour, the former is distinctly striped with four black lines, the two central ones extend from the anterior edge to the centre of the back, a little over the suture; the lateral ones are interrupted at the transverse suture, the portions in front of which assume the shape of an oval black spot, while the hinder portions are prolonged in straight lines to the hinder part of the thorax. The abdomen is of a flattened oval shape, pointed at the apex, and of an uniform grey colour. The poisers are black, as in the males, the scales nearly

\* Die Dipterengattung *Lasiops*, Mg. ap. Rd., Mittheil. d. münchener Ent. Ver., 1880, p. 123.



white; the wings clear, and the legs as in the male, but less hairy. There is no doubt but that the *Musca decolor* of Fallén, also described by Meigen and Zetterstedt by that name, all of whom only knew the female, is the opposite sex of *T. cunctans*, though neither of the first two authors were aware of it. Zetterstedt\* suspected that his *A. innocens* might be the same as Meigen's *cunctans*, and adds that perhaps it is the male of *A. decolor*. The description of his *A. innocens*, however, does not apply to *T. cunctans* in some points.

#### T. SEMIPELLUCIDA, Zett.

This very well marked species has been confounded with Meigen's *Lasiops apicalis*, which there is no doubt is the same as *Hyetodesia semicinerea*, Wdm. *T. semipellucida* also bears a very strong general resemblance to that species, and they are often mixed up in collections; but they may easily be distinguished by the following characters: in *H. semicinerea* the arista is decidedly sub-plumose both in male and female, while in *T. semipellucida* it is almost bare in both sexes; in *H. semicinerea* the thorax of the male is more glabrous, and there is a patch of white reflections on each shoulder, which is absent in the other species; the wings of the males are only slightly darkened along the anterior margins in *H. semicinerea*, while they are quite fuscous in *T. semipellucida*; the abdomen is of a pale transparent yellow colour in *H. semicinerea*, with the apical segment black, together with a black dorsal central stripe, and black posterior margins to the segments, while in *T. semipellucida* the abdomen is of a dull brownish-yellow colour, darker towards the hinder part, with transverse black stripes, but without the central dorsal stripe or the black apex; the legs of the males are decidedly longer in *H. semicinerea* than in *T. semipellucida*, and the posterior tibiæ are ciliated on both sides with long hairs in the former, but are almost bare in the latter.

This little fly is generally distributed, but not very common.

#### T. PULCHER, sp. n.

*Mas, niger, nitidus; oculis tenuiter hirtis; abdomine oblongo-ovato, cinereo, albo-micante, sub-striato; alis subfuscis; halteribus flavidis; pedibus simplicibus.*

*Femina, obscure cinerea; oculis sub-nudis; thorace abdomineque concoloribus innotatis; alis hyalinis.* *Long. 1½ and 2 lin.*

♂. *Head*: eyes sub-contiguous, with short hairs; forehead and face not prominent, epistome slightly projecting; antennæ a little prolonged, the third joint about twice as long as the second; arista long, thickened, and slightly pubescent at the base, the remainder slender and bare.

*Thorax* with *Scutellum* shining brownish-black, and unstriped.

*Abdomen* hairy, oblong-oval or conical, of a brownish-grey colour when viewed from before backwards, but when seen in the opposite direction, appearing of a glistening whitish- or bluish-grey colour (glaucous), marked with faint brown dorsal reflections, assuming the form of a dorsal stripe, dilating into indistinct triangular spots or patches; sub-anal organs small.

*Wings* more or less tinged with brown; third and fourth longitudinal veins slightly diverging at their extremities; external transverse vein straight and upright.

\* Dipt. Scand., vol. iv, p. 1523.



*Calyptra* yellowish-white, rather small, but with unequal scales. *Halteres* yellow.

*Legs* black, with few hairs or bristles; posterior femora rather long, almost bare along their anterior two-thirds, but furnished with a loose tuft of a few long hairs on both sides of their hinder extremities; posterior tibiæ bare, with the exception of two or three shortish bristles on their outer sides.

♀ rather smaller than ♂. *Head*: eyes nearly bare, separated by a wide black space, occupying nearly a third of the width of the head. *Thorax* and *Abdomen* of a brownish-grey colour, without markings. *Wings* clear. Other characters similar to those of the male.

This small species is generally distributed, especially in the North of England; it bears a good deal of resemblance in size, shape and colour to *Mydæa vespertina*.

#### T. ROSTRATUS, sp. n.

*Mas*, *nigrescens*; *ore valde producto*; *abdomine glauco-cinereo, linea dorsali et facis transversis nigris signato*; *tibiis posticis incurvis, apicibusque calcare acuto armatis*; *halteribus nigris*.  
Long. 3 lin.

*Head*: eyes long-haired, and contiguous; forehead prominent; face white, with black reflections; antennæ black and short, the third joint rather longer than the second; arista sub-pubescent; lower surface of head flat, with the anterior part projecting forward below and beyond the antennæ in the form of a snout; opening of the mouth large; proboscis thick and rather elongated; palpi filiform and black.

*Thorax* black, clothed with thin grey tomentum, and without distinct stripes; shoulders greyish-white; scutellum black.

*Abdomen* hairy, conical, and rather elongated; the four segments nearly equal in length, the first black, the other three of a glaucous or greyish-white colour, with black reflections, which show differently in different aspects; when viewed from before or the side, they assume the form of six semi-lunar spots, one placed on each side of the base of each segment; but when seen from behind, there appears to be an interrupted central dorsal stripe, dilated at the posterior edge of each segment into a triangular spot, the lower angles of the base of which are continued into a transverse, whitish black band, which encircles the posterior margin of each of the three last segments; anal segment thickened, but without projecting appendages.

*Calyptra* well developed, white. *Halteres* black.

*Wings* clear, third and fourth longitudinal veins divergent; internal and external transverse veins near together, the latter straight.

*Legs* black, with posterior femora ciliated along their whole under-surfaces with hairs of moderate and even lengths; posterior tibiæ curved inwards, shortly ciliated along their outer sides, and armed with a strong sharp pointed spur a little before their apex on their inner sides, which are otherwise nearly smooth.

The female is unknown to me.

I have seen but one specimen of this well-marked and peculiar species, which was in an imperfect condition, having lost the anterior tibiæ and tarsi, and the middle legs entirely; it was in a collection of unnamed British *Diptera* made by the late Mr. Francis Walker, the locality being unmarked. It is closely related to the *A. subrostrata* of Zetterstedt, but differs essentially by having the posterior tibiæ spurred.

(To be continued).



ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(continued from page 176.)

12. HOMALOMYIA, Bouché.

*Gen. ch.*—Head smooth and semi-circular; eyes large, covering the sides of the head; bare, and sub-contiguous or approximate, in the males; arista sub-pubescent or bare, with the second joint often rather elongated; alulets of moderate or small size, with the scales more or less unequal; abdomen mostly elliptical and flattened in the males, and marked with an angulated dorsal stripe; oval and immaculate in the females; wings with the anal vein shortened, and the axillary vein curved towards its extremity; legs with the middle tibiæ tuberculated, or thickened and ciliated, in the males.

Sect. 1—*Legs more or less pale.*

- |                           |                      |
|---------------------------|----------------------|
| 1. APRICA, Hal.           | 2. FUSCULA, Fall.    |
| <i>Passerinii</i> , Rond. | 3. PALLITIBIÆ, Rond. |

Sect. 2—*Legs wholly or nearly black.*

Div. i—*Halteres pale.*

- |                                  |                           |
|----------------------------------|---------------------------|
| 4. SCALARIS, Fab.                | 10. HERNIOSA, Rond.       |
| <i>saltatrix</i> , Desv.         | 11. MUTICA, Zett.         |
| 5. CANICULARIS, Lin.             | <i>lepida</i> ?, Wdm.     |
| <i>M. domestica minor</i> , Deg. | 12. SOCIELLA, Zett,       |
| 6. INCISURATA, Zett.             | 13. SERENA, Fall.         |
| 7. MANICATA, Meig.               | <i>lugubrina</i> ?, Zett. |
| <i>peniculata</i> ?, Rond.       | 14. FLORICOLA, Meig.      |
| 8. ARMATA, Meig.                 | <i>cilicrura</i> , Rond.  |
| 9. SPISSATA, <i>sp. n.</i>       |                           |
| <i>armata</i> ?, Macq.           |                           |

Div. ii—*Halteres black.*

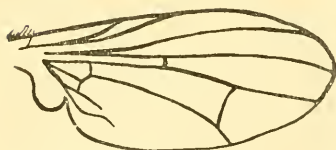
15. CARBONARIA, Rond.  
    *area*?, Meig.

This is one of the best defined and most natural groups among the *Anthomyiidae*. It includes the *Chorellie* of R. Desvoidy, so named from the habit of the males to perform choral dances in the air. The peculiar structure of the last two longitudinal veins of the wing (see fig.\*) is common to this and the three following allied genera, viz., *Cæatomyia*, Haliday, *Piezura*, Rondani, and *Azelia*, Desvoidy.

\* Wing of *H. aprica*.

## H. APRICA, Hal.

This fine species is the largest and most highly developed in the genus. The middle and the posterior legs have the femora and tibiæ of a bright reddish-yellow colour in both sexes. The front pair have the femora and tibiæ dusky in the males. The females have the coxæ yellow, and also the anterior femora and tibiæ in many specimens; but sometimes they are darkened, as in the males. The abdomen is sometimes grey in both sexes, and sometimes partly yellow and translucent. It is generally distributed but not common. The females are more frequently seen than the males.



## H. FUSCULA, Fall.

Of this rather peculiar and well-marked species, which has the tibiæ reddish or piceous, I have only seen a single female, which I captured near Edinburgh in August, 1875. The best description is given by Zetterstedt, in the *Diptera* of Scandinavia. He notices the male in the 4th vol., p. 1686, and, in vol. 8, p. 3310, gives a correct account of the female, which has the frontal space comparatively narrow. He says that both sexes of this fly were found by Stæger in the nest of a humble bee. The specimen which I found was covered by a number of *Acari*, similar to those which infest bees and beetles, so perhaps it had been in a bees' nest.

## H. PALLIDULE, Rond.

This small species has the knees and tibiæ pale, in both sexes. It appears to be rare; I have one pair (♂ & ♀) captured in the neighbourhood of Bradford.

## H. SCALARIS, Fab.

This common species, characterized by the projecting tubercle on the inner sides of the middle tibiæ of the males, sometimes has the anterior tibiæ yellow at their bases, when it forms the *A. manicata* of Macquart (not of Meigen). I have a variety in which the second and third abdominal segments are yellow and translucent at their sides, as in *H. canicularis*; this is probably the same as the *A. subpellucens*, Zett.

## H. CANICULARIS, Lin.

This, though the best known and the most common species, and the one which is generally considered as the type of the genus, really possesses fewer characteristic features than most of the others; the eyes being proportionately smaller, covering less of the cheeks, and the middle tibiæ being simple, without any tubercle or marked thickening.

## H. INCISURATA, Zett.

This species bears a very close general resemblance to *H. scalaris*, in size, shape and design; it differs, however, by having the thorax grey, not black, marked by two or more less distinct stripes, and by the intermediate tibiæ being simple, as in *H. canicularis*. Rondani does not seem to have known this species, for he confuses it with *H. lepida*, Wdm., which appears to me to be synonymous with *H. mutica*,

Zett. The females of *H. incisurata* and *H. scalaris* are very similar, but may be distinguished by the neururation of the wings, the third and fourth longitudinal converging a little in the latter, and being almost parallel in the former species. It is not very common, but generally distributed.

## II. MANICATA, Meig.

The males of this pretty species are characterized by having the anterior knees pale, and also the fore tibiae, with the exception of their apices, which are black, thickened, and furnished on their outer sides with a little tuft of black hairs, which is sometimes adpressed so as to be easily overlooked; a long straight spine also projects downwards from the base of each middle coxa. The females may be distinguished by the pale colour of the fore tibiae. Not common.

## II. ARMATA, Meig.

This little species differs from most of the others by having the abdomen wide and less elongated. Meigen's description is very correct, but he omits to mention that the posterior tibiae are curved as well as thickened, and ciliated with longish hairs on both sides. The females of this and many other species of *Homalomyia* are very difficult to determine, unless they are captured together with the males. Generally distributed.

## II. SPISSATA, *sp. n.*

*Mas, niger nitidus, abdomine oblongo depresso glauco, linea dorsali angulata ornato; femora intermedia subtilis hispida; tibiae intermediae nude abruptè spissatae; tibiae posticae intus ciliatae.* Long.  $2\frac{1}{4}$  lin.

*Head:* eyes sub-contiguous; arista bare.

*Thorax,* with the scutellum, black, shining, and unstriped.

*Abdomen* oblong and depressed, grey with glistening white reflections when viewed from behind, and appearing of a brownish-black colour when seen from before. It is marked by an interrupted dorsal band, which is dilated at the base of each segment into a triangular spot; anal processes very small.

*Wings* slightly nigrescent, third and fourth longitudinal veins parallel; external transverse vein nearly straight and upright, separated from the internal transverse vein by about twice the distance that it is from the termination of the fifth longitudinal.

Scales of *Calyptra* of moderate size and unequal length, and of a sordid white or brownish colour. *Halteres* yellow. *Legs* black, with the exception of the bases of the anterior tibiae, which are testaceous; front pair simple; middle femora furnished beneath with longish black bristles, not extending to the apex, and arranged in two parallel rows; coxae without spines; middle tibiae abruptly thickened or tuberculated on their inner sides at about one-third from the lower end; tubercle smooth, not ciliated; posterior tibiae slightly curved, somewhat thickened, furnished with a few long hairs in the middle of their inner surfaces, and with a number of bristles and hairs of irregular lengths on their outer sides.

This is possibly the *H. armata* of Macquart; it differs from *H. armata* of Meigen, and also from *H. manicata* of Meigen, by having the tubercular projection on the middle tibiae smooth and not bearded with short hairs as in both those species.

The tubercle resembles that of *H. scalaris* in being smooth, but is proportionately smaller and less prominent.

I captured a single male of this rare species at Tingewick, near Buckingham, in August, 1873.

#### H. HERNIOSA, Rond.

This differs from all the other species in the genus by the males having a large projecting sub-anal process. The abdomen is black with grey reflections, but without any distinct dorsal stripe. The wings are slightly fuscous, and have the anal veins rather more elongated than usual, with the axillary veins straighter and placed almost parallel with the anal. It is rather an aberrant species, and appears to be rare; I have only seen three specimens, all captured in the neighbourhood of Bradford.

#### H. MUTICA, Zett.

This species is probably the same as the *H. lepida* of Wiedemann and others (not of Zetterstedt), and the *H. prostata* of Rossi and Rondani; but the descriptions given of these species are not sufficiently precise to enable one to determine the point with accuracy, and it is very likely that more than one distinct species have been mixed together under the name of *H. lepida*. For these reasons I have adopted the title of *mutica*, as the description given of that species by Zetterstedt agrees with the characters of the fly which I wish to discriminate. It is from 2 to 2½ lines in length; the calyptra have the scales of moderate size, and of marked inequality; the thorax is black; the abdomen grey, with brownish-black reflections, and the usual angulated black dorsal stripe; the intermediate tibiæ are gradually (not abruptly, as in *H. armata*) thickened towards their extremities, and ciliated with very short hairs on the inner sides of the thickened parts; the posterior tibiæ are slightly curved inwards, ciliated along the whole of their external surfaces with a row of hairs of moderate and even lengths; and have on their inner sides some long hairs in the middle, and others which become shorter towards each extremity; the wings are slightly fuscous. It is not uncommon.

#### H. SOCIELLA, Zett.

This is a well-marked species, of about the same size as the last. The thorax has a grey tinge, the shoulders being whitish; the abdomen is ash-grey, marked by a narrow black sub-interrupted dorsal stripe, with very indistinct or no angular dilatations; the intermediate legs have the femora ciliated with long hairs of even lengths along their posterior surfaces, and are furnished with a long row of spines on their under sides; the middle tibiæ have yellow bases, are very slightly thickened towards their extremities, and ciliated with soft short hairs along the whole length of their inner surfaces; the posterior tibiæ are simple, having no bristles or long hairs on their sides, with the exception of the two or three usual spines on their outer surfaces. A rare species. I only possess a single male, captured near Bicester, Oxon.

#### H. SERENA, Fall.

This is a small species, only from 1½ to 2 lines in length; the calyptra are small, with scales almost equal in size; the wings have a brownish tinge; the abdomen is narrow, and often with a reddish or yellowish tinge, and somewhat translucent



at the base ; it is marked by the usual angular stripe (as in *H. scalaris*) ; the legs are often piceous ; the middle femora are ciliated beneath with long hairs, the middle tibiæ are thickened along their lower halves, and ciliated nearly the whole length of their inner sides, the hairs becoming longer towards the apices ; the posterior tibiæ have a few long hairs of irregular lengths on their outer sides, and only the usual short adpressed ones on their inner surfaces ; the poisers and scales are sometimes fuscous. Not very common.

## II. FLORICOLA, Meig.

This species may be readily known by its brownish wings, and widish, straight, interrupted dorsal band on the abdomen, having no angular dilatations. The tibiæ, especially the posterior ones, are piceous or sub-rufous ; and there are six strong projecting spines on the infra-thoracic surface, one arising from the base of each coxa. Not uncommon.

## II. CARBONARIA, Rond.

This little black species is well marked, and generally distributed ; the calyptæ are small, and, with the halteres, black ; the wings are fuscous ; the abdomen is short and wide, flattened, and marked with the usual angulated dorsal stripe ; the middle tibiæ are thickened towards their ends, which are shortly ciliated on the inner sides ; the posterior tibiæ are unarmed ; there is a minute black spur or tooth-like process on the under-side of each middle metatarsus at its base ; a similar but larger process is found in the same situation in *H. armata* ; on close inspection with a good lens, this is apparently formed by a pencil of rigid black hairs. I believe this species to be identical with the *A. ærea* of Meigen, but not with that of Zetterstedt ; the latter is considered by Loew to be the same as the *A. gibbera* of Meigen, and to belong to the genus *Azelia*.

(To be continued).

V. J. P. 221.



ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(continued from page 205.)

with R. P. 205

13. PIEZURA, Rond.

*Gen. ch.*—Head smooth and semi-circular; eyes large, bare, and sub-contiguous in the male; antennæ long, the third joint about three times the length of the second; arista plumose; alulets of moderate size, with unequal scales; abdomen depressed, with five distinct segments; wings with the veins as in the genus *Homalomyia*; legs simple.

*P. PARDALINA*, Rond.

This genus contains, as yet, only one recorded species, which bears a strong general resemblance in form and structure to those in the genus *Homalomyia*, but differs by having the arista plumose, and the abdomen with five segments, four only being distinct in the *Homalomyia*.

*P. pardalina* is of a pale yellowish colour, the face is silvery-white; the eyes in the male are bordered, and separated above, by a double white stripe, which extends to the vertex, where a small elongated triangular black spot is interposed, upon which the ocelli are placed; the antennæ are yellow, with the third joint grey, the colour becoming darker towards the end; the thorax is pale slate-grey, and has a wide central longitudinal dark stripe, with two lateral, somewhat semi-lunar, longitudinal spots, one over the base of each wing; the shoulders are yellow; the scutellum is grey at the base, but yellow at the apex; the abdomen is yellow, with a more or less distinct, narrow, interrupted, black dorsal stripe on the last three segments, and a black mark on the margins of the third and fourth segments; the sub-anal male appendages are large, globular, and of a yellow colour; the legs are entirely yellow, with the exception of the tarsi, which are black. Long. ♂, 6 mill.\*

I have not seen a female, but Rondani says that it is very similar to the male.

This peculiar species appears to be rare on the continent of Europe, as well as in England. I am not aware that its occurrence has been recorded anywhere except in Italy. I have seen two British specimens; one was captured by myself near Bicester, in Oxfordshire, and the other was found by Mr. C. W. Dale near Oxford.

14. AZELIA, R. Desv.

*Atomogaster*, Macq.

*Anthomyia*, p. Meig., Schin.

*Aricia*, p. Zett.

*Gen. ch.*—Head round; eyes very large, bare, contiguous in the

\* I gladly accept the suggestion made by Mr. McLachlan in the last number of this Magazine, and for the future will use millimètres instead of lines in the measurement of *Diptera*.

males; ocelli large and prominent; frontal bristles wanting; arista bare, or pubescent; alulets small, but with the scales usually unequal in size; abdomen cylindrico-conical, with only four distinct segments, each of which is mostly marked with three spots, one central and elongated, and two lateral and round; wings veined as in the *Homalomyia*, but with the axillary less approximated to the extremity of the anal veins: hind tibiæ of the males often bearded on one or the other side with long hairs.

Females with the eyes separated by a moderately wide space, furnished with a single row of small bristles on each side; abdomen pointed, and marked as in the males, but with smaller spots.

Sect. 1—*Halteres pale*.

|                                                             |  |                                                   |
|-------------------------------------------------------------|--|---------------------------------------------------|
| 1. MACQUARTI, Stæg.<br><i>triquetra</i> , p. Macq.          |  | 3. CILIPES, Hal.<br><i>triquetra</i> , p. Macq.   |
| 2. ZETTERSTEDTI, Rond.<br><i>triquetra</i> , Fall. et Zett. |  | <i>tibialis</i> , Stæg.<br><i>Stægeri</i> , Zett. |
| 4. TRIQUETRA, Wied. et Meig.<br><i>nudipes</i> , Zett.      |  |                                                   |

Sect. 2—*Halteres black*.

|                                            |  |                    |
|--------------------------------------------|--|--------------------|
| 5. GIBBERA, Meig.<br><i>ærea</i> , Zett. ? |  | 6. ATERRIMA, Meig. |
|--------------------------------------------|--|--------------------|

This group, though closely related to the *Homalomyia*, is well characterized, and has been recognised as forming a distinct genus by most modern authors, except Schiner, who, in his most valuable work (*Fauna Austriaca, Diptera*), still retains it in his great and heterogeneous genus *Anthomyia*. It was elaborately monographed by H. Loew in 1874,\* and revised by Rondani in 1877.†

The British species in the first section may be thus tabulated:—

|                                                               |                 |
|---------------------------------------------------------------|-----------------|
| Hind tibiæ of ♂ with long hairs on both outer and inner sides | 1. MACQUARTI.   |
| ” ” ” on inner sides only                                     | 2 ZETTERSTEDTI. |
| ” ” ” on outer sides only                                     | 3. CILIPES.     |
| ” ” ” on neither side                                         | 4. TRIQUETRA.   |

All these four species have the alulets and wings more or less fuscous or nigrescent. *A. Macquarti*, which is the most common, is also usually the largest; besides having long ciliæ on both sides of the hind tibiæ, the males are also furnished with a single long straight bristle in the middle of the under-side of the middle femora. The females sometimes have the fore tibiæ piecous, or even testaceous, and may be found in abundance on horse-droppings in roads in woody places. I know of no

\* Entomologische Miscellen, Breslau. † Dipterologie Italica Prodrum, Vol vi.

specific characters by which they may be distinguished from the females of the allied species. *A. Zetterstedti* has the long ciliae of the hind tibiae arranged in a double row on the inner and anterior sides, and has two or three strong bristles on the under-surface of the middle femora. This little species (usually the smallest) is not uncommon. I do not know the female. *A. cilipes* has the beard on the hind tibiae of the males longer and stronger than in either of the other species, and placed on the outer (or rather hinder) sides only; it has also a single very long bristle projecting straightly outwards a little before the end of the tibia below the beard. The legs are all more or less piceous, the tibiae being often testaceous. In size it nearly equals *A. Macquarti*, the males being about 5 millimètres in length. It is not common. The female is unknown to me. *A. triquetra* is about the size of *A. Zetterstedti*, or a little larger, the males measuring from  $3\frac{1}{2}$  to 4 millimètres in length. It is easily known by its simple hind tibiae. There is usually one long bristle on the under-side of the middle femora, as in *A. Macquarti*. It is generally distributed. I have not seen the female.

#### A. GIBBERA, Meig.

This little species, from  $2\frac{1}{2}$  to 3 millimètres in length, has black halteres, as well as nigrescent alulets and wings; the thorax is deep black; the abdomen is dark grey, marked in the ordinary manner, but with the spots large and sometimes confluent, when they become indistinct; the scales of the alulets are very small, and almost or quite equal in size; the hind tibiae are ciliated on the under-side with long hairs arranged in two rows. Very rare. I have only seen one male, captured by Mr. Verrall at Rannoch, which he kindly sent for my inspection.

#### A. ATERRIMA, Meig.

This is an aberrant species, the abdomen being without the characteristic spots; it resembles the other species in the genus, however, by the form and structure of the head, abdomen, and wings. It is entirely black, with the exception of a narrow white seam on the posterior edge of each abdominal segment; the halteres are quite black, as well as the alulets, the scales of which are small and equal in size; the wings are nigrescent; the legs are black; there is a single straight bristle on the under-side of each middle femur; the hind tibiae are simple. Size of male about 3 mm. I have seen but one specimen of this little fly, also from the collection of Mr. Verrall.

### 15. CÆLOMYIA, Hal.

*Homalomyia*, Rond.

*Aricia*, p. Zett.

*Gen. ch.*.—Eyes of moderate size, bare, sub-contiguous in male, not covering the lower third of the sides of the head; forehead and epistome rather prominent; proboscis membranous and somewhat elongated; arista tomentose; abdomen with five segments, very depressed, membranaceous beneath, concave, and without plica; alulets small and sub-equal; wings and legs as in the *Homalomyia*.

This genus\* differs from all the three preceding ones by having the head more or less angular, with smaller eyes and prominent forehead and epistome. The concave membranaceous state of the ventral surface of the abdomen, which looks as if the under halves of the rings had disappeared, is not exclusively confined to this genus, for the same peculiarity may be observed in the *Homalomyia*, but the "plica" (a membranous, or vascular?, cord, with diverging processes, which connects the base with the apex of the abdomen) is always present in the latter genus, while it is very short and almost abortive in *Cæatomyia*.

C. MOLLISSIMA, Hal.

*spatulata*, Zett.

This, the only known species, is peculiar by having the abdomen of the males of an obovate or spatulate form;† the wings and alulets are nigrescent; the halteres yellow; the thorax black and unstriped; the abdomen grey, marked with a longitudinal line and three broad transverse marks, which assume a triangular form, being attenuated towards the sides; the legs are black, the middle femora are thickened in the centre, and furnished beneath with a strong black beard; the middle tibiæ are narrow at the base, and become gradually larger towards the end, which is ciliated on the inner side with short hairs.

The female has the forehead prominent, the eyes separated by a wide space of a whitish-grey colour, with a black central stripe (often red in front); the thorax grey, and rather indistinctly striped; the abdomen short, oval, and pointed, of an uniform greyish-black colour; the wings grey, with yellow bases; the alulets and halteres yellow; the legs simple.

This peculiar species occurs chiefly in the north of England. I have found both sexes in tolerable abundance in a swampy place in a wood near Bradford, during the month of May, upon the flowers of *Calltha palustris*.

(To be continued).

G. J. 265. (1882).

\* Haliday's description is given in a note in Westwood's Generic Synopsis at the end of the second volume of his Introduction to the Modern Classification of Insects, p. 143. It is as follows: "*Cæatomyia*. Abdomen, ♂, obovatum, ventre concavo toto membranaceo (absque plica aut linea coriacea longitudinali). Facies brevis impressa. Peristoma oblongum. Labium subelongatum (membranaceum tamen). Calyptra jam minima (ut in *Homalomyia* division 2, *Delio* R. D.). Antennæ pedes absque *Homalomyia*."

† I consider that this should be looked upon as a specific, and not as Haliday made it, a generic character.



ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(continued from page 224.)

16. HYLEMYIA, R. Desv.

*Gen. ch.*—Eyes bare, contiguous or sub-contiguous in the male; arista plumose, or sub-plumose; alulets small, with scales of equal size; abdomen usually prolonged with five segments, conico-cylindrical, or oblong flattened and narrow; the ventral surface often furnished with tufts of hair, and the anal male appendages prominent: wings with the third and fourth longitudinal veins parallel, or slightly divergent; anal vein prolonged to the margin: legs simple.

Sect. 1—*Legs wholly or nearly black.*

Div. i—*Arista long haired.*

- |                    |                                 |
|--------------------|---------------------------------|
| 1. HILARIS, Fall.  | 4. LASCIVA, Zett.               |
| 2. VIRGINEA, Meig. | 5. FLAVIPENNIS, Fall.           |
| 3. VARIATA, Fall.  | <i>crassirostris</i> , Meig. ♀. |

Div. ii—*Arista short haired.*

- |                             |                                  |
|-----------------------------|----------------------------------|
| 6. SETICRURA, Rond.         | 9. PULLULA, Zett.                |
| 7. CARDUI, Meig.            | <i>longula</i> , Meig. non Fall. |
| <i>brunnescens</i> ?, Zett. | 10. CINERELLA, Meig. non Fall.   |
| 8. NIGRESCENS, Rond.        | 11. CINEROSA, Zett.              |
|                             | 12. ANTIQUA, Meig.               |

Sect. 2—*Legs more or less pale.*

Div. i—*Arista long haired.*

- |                         |                      |
|-------------------------|----------------------|
| 13. STRIGOSA, Fab.      | 16. PUELLA, Meig.    |
| <i>vulgaris</i> , Panz. | 17. OPEROSA, Meig.   |
| 14. NIGRIMANA, Meig.    | 18. COARCTATA, Fall. |
| 15. PREPOTENS, Wdm.     |                      |

Div. ii—*Arista short haired.*

19. TIBIARIA, Rond.  
*ceparum*?, Meig.  
*antiqua*?, Schin.

The distinctive characters between the species in this genus, and those in *Hydrophoria*, are somewhat difficult to define; the only positive point of difference being the comparative size of the scales of the alulets, which are unequal in size, and larger in proportion, in *Hydrophoria* than in *Hylemyia*. Schiner has repudiated the genus *Hydro-*

*phoria* altogether, placing *H. conica* and *H. linogrisea* in *Hylemyia*, and removing *H. divisa* into the unspotted division of his genus *Spilogaster* (*Mydæa*). While, however, some of the more highly developed species of this genus are closely related to some of those in *Hydrophoria*, many of the others are very feebly organized, having very small alulets and narrow flattened bodies.

The arista should always be distinctly plumose or hairy in all species placed in this genus, but there are a few in which the hairs though distinct are short, and some of these have been placed by one author in one genus, and by others in another, thus creating a good deal of confusion: *H. antiqua* and *pullula*, for instance, are included by Schiner in his great genus *Anthomyia*, along with *H. cardui*; while Rondani places them more correctly in the present genus.

#### *H. HILARIS*, Fall.

This fine well-marked species is rare. I have only seen one British example, which was sent to me by Mr. B. Cooke, of Southport.

#### *H. VIRGINEA*, Meig.

This large species is also rare. I captured a single male in August, 1873, at Tingewick, near Buckingham. The legs, though black, have all the knees as well as the bases of fore tibiæ pale.

#### *H. VARIATA*, Fall.

This little species, which abounds everywhere, may be recognised by its narrow conico-cylindrical abdomen, marked by a slender longitudinal dorsal stripe, which becomes attenuated towards its extremity; and by the arista being furnished with very long but few hairs. The thorax is striped by three, or rather five longitudinal black bands, which are more distinct in the female than in the male. The forehead is prominent, the eyes contiguous behind in the latter sex, but rather widely separated in the former, the frontal space being rufous at its fore part.

#### *H. LASCIVA*, Zett.

This species is almost as common as the last, and is often confounded with it; it differs, however, by being rather smaller, much blacker, and more hairy. The thorax is indistinctly striped; the abdomen is flat and oblong, not conical; the subanal processes are much larger; the dorsal stripe is wide and of equal width over each segment, except the last, on which it is indistinct; the head is round, and the forehead less prominent than in *H. variata*; the arista is very similar.

Length, about 4 mm. (2 lin.).

#### *H. FLAVIPENNIS*, Fall.

In this species the arista is long and thickly haired; the proboscis is thick and fleshy, especially in the female; hence the name given to it by Meigen, who only knew that sex. The thorax is nearly black and indistinctly striped; the abdomen

is dark grey, cylindrico-conical, hairy, with an interrupted dorsal stripe, formed by three widish tapering black spots; the wings are of a brownish-yellow colour, more intense at the base; the hind tibiæ of the males are clothed along their front and inner surfaces with soft hairs of moderate length. The female has the frontal space black, and the abdomen nigrescent and immaculate. Rather local, not uncommon in Yorkshire, and I have received it from Mr. Dale, in Dorsetshire.

## II. SETICRURA, Rond.

This well-marked species has only been described by Rondani. It is characterized by the arista being rather shortly but thickly haired; the face slightly prominent; the eyes of the male contiguous; the proboscis thick, as in *H. flavipennis*; the thorax yellowish-grey, with five longitudinal stripes; the abdomen oblong, flattened, very hairy, ash-grey, with a narrow longitudinal stripe; the sub-anal appendages of the male large, and furnished in front with two projecting hairy lobes; the wings sub-luteous; the legs spinous; and the hind tibiæ thickly armed with long rigid hairs, or fine bristles, along the whole of their inner and front sides. The females, which were unknown to Rondani, have the eyes separated by a wide space, having a central red stripe, bordered by a white margin on each side about half the width of the stripe; the thorax marked as in the male; the abdomen brownish-grey, conical, hairy, and immaculate; the wings nearly colourless, strongly ciliated along the front half of the costa, and with a long costal spine (the costa is nearly smooth in the male). The legs are spinous. Generally distributed.

Length of both sexes, about 6 mm. (3 lin.).

## H. CARDUI, Meig.

The diagnosis of this species is involved in a good deal of obscurity. It was not known to either Zetterstedt or Rondani; the former, however, probably confounded it with his *A. brunnescens*, for the descriptions of the two species correspond pretty closely, and in his last volume he remarks that Dr. Winnertz in 1856 sent him a specimen of *A. brunnescens* under the name of *Anth. cardui*, Meig.

I have not seen a typical example of *H. cardui*, but shall give a short account of the British species, which appears to me to correspond most closely to the descriptions given by Meigen and Schiner of that insect.

Eyes of male sub-contiguous; face sub-prominent, white with brown reflexions; epistome unprojecting; arista with short hairs, and having a shining black, short, oval prominence at its base; thorax brownish-grey, with greyish-white sides, marked with three longitudinal black stripes, one central, straight, diminishing in breadth from before backwards, and two lateral, sinuous and irregular; the stripes are separated by two rows of bristles, which give the thorax the appearance of being five striped; addomen long, narrow, depressed, and hairy, with the second segment prolonged, ash-grey with black reflexions, marked with a black interrupted longitudinal dorsal stripe, and transverse lines; the sub-anal process of the male is furnished with two projecting lobes, and there is a tuft of shortish black hairs on the under-surface of the middle abdominal segment; wings yellowish-brown, the third and fourth longitudinal veins parallel to each other behind the external transverse vein; fore tibiæ with one bristle projecting from the middle of the external

surface, in addition to the apical ones ; hind tibiæ with a few short bristles on their inner surfaces, and five or six longer ones, of even lengths, arranged along the outer sides, at nearly equal distances from each other. I do not know the female.

Length of male, 6 mm (about 3 lin.).

This species seems local. I captured a number of specimens near Risborough, in Buckinghamshire, in June, 1879, but have not met with it in any other locality.

#### H. NIGRESCENS, Rond.

This species closely resembles the last, and may easily be confused with it ; it is, however, distinct, and may be known from *H. cardui* by the following points of difference : the eyes of the male are contiguous, the epistome slightly prominent, the arista has rather shorter hairs, and has a slightly prolonged thickening at the base instead of a bead-like prominence, as in *H. cardui* ; the thorax is indistinctly striped and less white on the sides than in *H. cardui* ; the third and fourth longitudinal veins of the wings are slightly divergent ; the fore tibiæ are without any spines on their outer surfaces, besides the apical one ; the hind tibiæ are more spinous externally than in *H. cardui*, and the spines are placed in irregular order. The female is unknown. Rare. I have two males captured in the neighbourhood of Bradford, and have received typical specimens from the continent.

#### H. PULLULA, Zett.

This little species may be known from all the others in the genus by the transverse veins of the wings being slightly clouded with black. Not uncommon.

#### H. CINERELLA, Meig.

This species is quite distinct from the *M. cinerella* of Fallén, with which Meigen confounded it ; the latter species has the arista nearly bare, and belongs to the genus *Chortophila*. The present insect has the arista distinctly plumose, though rather short-haired ; the face is somewhat prominent ; the eyes of the male sub-contiguous ; the dorsum of the thorax blackish-brown, with an indistinct central stripe, and an irregular black line on each side, below which the sides are of a grey-white colour ; the scutellum is pale grey ; the abdomen is long, narrow, and conical, grey, with a narrow longitudinal dorsal stripe ; the hind legs are long, with the tibiæ spinous ; a few short spines being situated on their inner sides in the middle. Rare. I have three males which were found near Bradford, and I have also received it from Austria.

#### H. CINEROSA, Zett.

This, though supposed by Zetterstedt to be the same as the *A. cinerella* of Meigen, is quite distinct. The face is less prominent ; the thorax (with the scutellum) is of an uniform greyish-brown colour ; the sides are pale, but are not separated from the dorsum, as in the former species, by a black line ; the abdomen is oblong and flattened, of a dark grey colour, and marked on the dorsum with four wide sub-confluent triangular black spots, instead of with a straight narrow line ; the hind legs are proportionately shorter than in *H. cinerella*, and the hind tibiæ are clothed on their inner sides with soft hairs instead of bristles ; the wings are tinged with yellow in both species. Not common. I captured five males near Lake Windermere in June, 1874.

### H. ANTIQUA, Meig.

This rare species, of which I have seen but one British example, has been confounded with several others. It is shortly but clearly described by Meigen (vol. v, p. 166). The thorax is yellowish-grey with white shoulders, and is unstriped; the abdomen is flattened and elliptical, ash-grey, with a very fine, straight, sub-interrupted dorsal black line; the hind tibiæ are spinous. I have typical continental specimens of this fly named by the late Professor Rondani.

### H. STRIGOSA, Fab.

This is common everywhere in woods; it has the tibiæ only picceous in the males, and the femora, as well as the tibiæ, pale in the females.

### H. NIGRIMANA, Meig.

This species closely resembles the last, but is usually rather larger, and has the four posterior femora of the males, as well as all the tibiæ, pale. The females are difficult to distinguish from those of *H. strigosa*. Generally distributed, but not common.

### H. PRÆPOTENS, Wdm.

This fine species has all the femora and tibiæ yellow in both sexes; the anal segment of the abdomen, as well as the sub-anal male appendages, are also yellow; the wings have the third and fourth longitudinal veins strongly divergent, and the external transverse veins very oblique and sinuous. Rare.

### H. PUELLA, Meig.

This species closely resembles *H. virginea*, but has all the tibiæ testaceous, while in *H. virginea* only the bases of the fore tibiæ are pale. These two species are probably only varieties of the same. Rare.

### H. OPEROSA, Meig.

This species, of which I only know the female, is characterized by having the thorax, which is brown, marked by two wide irregularly (maculiform) shaped lateral stripes, and two narrow central lines, the sides being cinereous; the abdomen is conical, grey, and has a central dorsal stripe; the legs have all the femora black, but the tibiæ testaceous in both sexes. The female has the intraocular space black, except at the front margin, where it is red. Length, 4 mm. (about 2 lin.).

This fly, which is rare, bears a strong resemblance to *Hydrophoria conica*, but is much smaller and has little alulets.

### II. COARCTATA, Fall.

This is a well-marked species; the arista is furnished with hairs of medium length; the males have the thorax grey with the sides lighter, and the dorsum indistinctly striped; the abdomen hairy, oblong, narrow, flat, and cinereous, with an indistinct narrow dorsal stripe; anal segment grey, sub-anal appendages hairy, with two black lamellæ; wings with yellow veins; legs black, with pale tibiæ. The females have both the thorax and abdomen pale ash-grey, and immaculate, and the

four posterior femora, as well as all the tibiæ, pale. Not common. I found several specimens in the neighbourhood of Edinburgh in August, 1875, and have received it from Mr. B. Cooke, of Southport.

### H. TIBIARIA, Rond.

This peculiar species bears a very strong general resemblance to *H. cardui* in the colour, shape, and markings of the thorax and abdomen. It differs in having the arista rather longer haired; the tibiæ all piceous or testaceous, and above all in having the abdomen furnished in the middle of its ventral surface with a tuft of black hairs, so long that it extends in a curved direction backwards as far as the apex of the abdomen, and even sometimes beyond it.

Length, 7 mm. (about  $3\frac{1}{2}$  lin.).

The female is unknown. Not common. I have captured it at Thorpe Arch, near York. This species is probably identical with the *H. penicillaris* of Rondani, which I have not seen; the only difference between them appears to be that the legs are wholly black in the latter.

(To be continued).

### DESCRIPTION OF A NEW SPECIES OF *LIBURNIA*.

BY JOHN SCOTT.

Of finding new *Liburniæ* there appears to be no end; their numbers increase so rapidly. In the same lot from which the under-mentioned has been extracted, I believe there are at least two other new species. My collection being for comparison of no use, I, as a rule, when at a loss in this group, submit the doubtful example to M. Lethierry, the fortunate possessor of Dr. Fieber's collection, for identification. The following is a portion of the result of his kind investigation at this time.

#### *LIBURNIA INSIGNIS*, n. sp.

♂. Brachypterous. Pale yellowish. Crown about as broad as long, not projecting beyond the front of the eyes. Elytra reaching to about the middle of the abdomen, apical margin flatly rounded. Abdomen pitchy-black, posterior margin of the terminal segment broadly white; genital segment, viewed from the side, produced into an angular form posteriorly, and having a short, curved, acute tooth at the lower extremity.

Head: crown broad; breadth about equal to the length, basal foreæ distinct but not deep, the triangular space in front enclosed between the keels barely extending to the frons, anterior margin slightly convex, not projecting beyond the front of the eyes: face slightly brownish-yellow, broad, slightly narrowed between the eyes, central keel distinct but not prominent: antennæ yellow.

Pronotum: posterior margin flatly concave across the scutellum, side keels short, somewhat indistinct, disc on each side of the centre somewhat depressed. Scutellum: keels distinct, somewhat acute. Elytra reaching to about the middle of the abdomen, margin at the apex flatly rounded, nerves fine, not granulated. Legs yellow: thighs at the base fuscous. Abdomen pitchy-black, shining, with a large yellow or brownish-



BY R. H. MEADE.

(Continued from Vol. xviii, page 270).

## 17. LASIOPS, Meig.

*Gen. ch.*—Eyes of male hairy, contiguous or sub-contiguous; arista sub-pubescent or bare; abdomen ovoid or narrow, and depressed; alulets small, lower scale nearly or entirely covered by upper one; wings with the third and fourth longitudinal veins parallel, or a little convergent, and with the anal vein prolonged to the margin; legs with the hind tibiæ ciliated on both sides. Eyes of female only slightly pubescent.

1. CTENOCNEMA, Kowarz. | 2. ROEDERI, Kz.

3. MEADEI, Kz.

I have remarked under the genus *Trichophthicus* that the generic name *Lasiops* had been reserved by Rondani and Kowarz for a small group of Anthomyds which have hairy eyes, naked aristæ, very small alulets, and prolonged anal wing veins. Zetterstedt described two species in his great genus *Aricia* which belonged to this group (*A. glacialis* and *A. eriophthalma*), and Rondani one in his genus *Lasiops* (*L. anthomyinus*). None of these have been yet found in Britain, but Herr Kowarz, in his elaborate monograph, has determined five others in addition to the above, three of which belong to the British Fauna. These little flies closely resemble each other, and only differ by slight structural points, so that they may easily be confounded, and are very difficult to discriminate. They all have the back of the abdomen marked by a broad black longitudinal stripe, as well as by transverse black bands on the edges of the segments, so that the surface is divided into eight squarish grey patches, much in the same way as the abdomen of *Anthomyia radicum*, Linn., is marked; hence the name of *L. anthomyinus* given to the Italian species by Rondani.

## L. CTENOCNEMA, Kz.

The eyes in the male of this species are contiguous in the middle, and covered thickly with longish hairs; the thorax and scutellum are shining and brownish-black, the former is indistinctly striped, and whitish-grey on the sides and front edge; the abdomen is oblongo-conical, pointed at the apex, which is black and shining, with the sub-apical appendages (*hypopygium*) small, and the ventral lamellæ projecting and somewhat hairy; the alulets have the scales slightly unequal, and are fringed with long yellowish hairs; the wings have a brown tinge, with the third and fourth longitudinal veins decidedly convergent, and the external transverse veins

oblique; the legs have the hind tibiæ evenly ciliated with bristles of moderate length along the whole of their externo-posterior surfaces, and also with finer bristles or hairs on their internal and anterior sides; the pulvilli are small. Common in Yorkshire.

#### L. ROEDERI, Kz.

This species principally differs from the last by having the dorsum of the thorax and scutellum grey instead of black, and by the former being distinctly striped with three and sometimes five lines; the wings have the third and fourth longitudinal veins parallel until near their extremities, when they become slightly convergent; the armature of the hind legs is similar to that of *L. clenocnema*. I have captured a few specimens of this little fly near Bradford.

#### L. MEADEI, Kz.

This species closely resembles the other two in size and form, the length of them all being about 4 mm. (2 lin.); it differs from both *L. clenocnema* and *L. Roederi*, however, by having the hind tibiæ ciliated on their externo-posterior surfaces with only a few bristles of irregular lengths along the upper half, instead of with a regular even row down the whole length; the eyes also have shorter hairs; the thorax is blackish, with three distinct stripes; the alulets are fringed with a few black hairs, the third and fourth longitudinal veins are quite parallel, or sometimes slightly divergent; and the pulvilli are larger than in either of the preceding species. Found sparingly near Bradford.

I know of no decided character by which the females of the above three species can be distinguished from each other; those which I possess are rather smaller than the males, are grey in colour, have the eyes very slightly and indistinctly pubescent and widely separated, the frontal space occupying about a third of the width of the head. This space contains a black central stripe, bordered on each side by a whitish-grey margin, which is about one-third the width of the middle stripe. The thorax is light grey, with five pale brown longitudinal lines. The abdomen is grey, with a longitudinal black central stripe, and some transverse marks which are indistinct, and do not reach the edges of the segments. The wings are clear. The legs have the hind tibiæ ciliated only with a few spines on the outer sides.

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Before proceeding with the enumeration of the remaining species of *Anthomyiidae*, I must make a short digression. The genus *Anthomyia*, as restricted by Meigen in his supplementary (7th) volume, is so large, even after the species belonging to *Ophyra*, *Homalomyia*, and *Azelia*, which he included, have been abstracted from it, that it is necessary to sub-divide it further. This sub-division has already been attempted by R. Desvoidy, Macquart, and Rondani; the first author carried it, however, too far, and the groups which the others formed are very artificial and unsatisfactory, so I shall venture to propose a new arrangement.

In the first place, the pale-legged and pale-bodied species must be

separated from the black-legged ones, and replaced (with one exception) in the genus *Pegomyia* of Desvoidy and Macquart. By both these Dipterologists the genus was restricted to those species which have the bodies, as well as the legs, always more or less yellow; but I think it will be better to include in it all those with pale legs, whether the abdomen is yellow or not, for there are several species, as *A. hemorrhœa*, Zett., and *P. hyoscyami*, Desv., which have the abdomen sometimes partly yellow and sometimes entirely grey.

With respect to the black-legged species, I shall retain the name of *Anthomyia* for a small group (embracing Desvoidy's genera *Anthomyia* and *Egle*) which is more highly developed than the others, having the alulets rather larger with the scales unequal in size. The remainder of them must be again separated into two divisions; for the first of which I shall adopt Macquart's name *Chortophila*, restricting it (as Macquart did in theory) to those species which have the abdomen more or less thickened and cylindrical. To the second and largest division, which will include all those species which do not belong to either of the other groups, I shall give Desvoidy's name of *Phorbia*.\* The flies in this group have the abdomen narrow and elongated, or oblong, and flattened.

The above genera may be thus tabulated:

A. Abdomen and legs black or grey.

B. Alulets with the scales unequal in size.

Gen. 1. ANTHOMYIA, Meig.

BB. Alulets with the scales equal in size.

C. Abdomen in ♂ sub-cylindrical.

Gen. 2. CHORTOPHILA, Macq.

CC. Abdomen in ♂ narrow or oblong, and depressed.

Gen. 3. PHORBIA, R. Desv.

AA. Legs always, and body generally, partly pale (rufous or testaceous).

D. First longitudinal vein armed with spines.

Gen. 4. ACANTHIPTERA, Rond.

DD. First longitudinal vein unarmed.

Genus 5. PEGOMYIA, Desv.

## 18. ANTHOMYIA, Meig.

*Egle*, p. R. Desv.

*Gen. ch.*—Eyes bare, contiguous or sub-contiguous in the males; arista pubescent or bare; forehead and face slightly prominent; epistome often projecting; abdomen ovoid or oblong, and depressed, often

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The species placed by Desvoidy in this genus belong to his "*Anthomyæ herbicolaræ*." See *Essai sur les Myodaires*, p. 559.

much thickened at the apex in the males; alulets rather small, but with the scales unequal in size; wings with the third and fourth longitudinal veins parallel or slightly convergent at their extremities, anal vein prolonged to the margin; legs always black or grey.

1. PLUVIALIS, Linn.  
    *procellaris*, Rond.  
    *imbrida*, Rond.
2. ALBICINCTA, Fall.
3. PRATINCOLA, Panz.

4. RADICUM, Linn.  
    *rulgaris*, R. Desv.  
    *brassicæ*, Wdm.
5. SULCIVENTRIS, Zett.
6. OCTOGUTTATA, Zett.

#### A. PLUVIALIS, Linn.

This common pretty spotted fly varies a good deal, the spots often coalescing so as to alter the design on the thorax and abdomen. Two of the varieties thus produced have been exalted by Rondani into distinct species, but they possess no real specific distinctions.

#### A. ALBICINCTA, Fall.

This little species bears a good deal of resemblance to the last, but, besides being very much smaller, differs in having the thorax black, with two white spots on the hinder part in front of the scutellum. The abdomen is marked as in *A. pluvialis*, being white with a dentated black band at the base of each segment. Not common.

#### A. PRATINCOLA, Pz.

This species has the abdomen marked in a very similar manner to those of the two preceding ones, but the thorax is peculiarly figured, being of a whitish-grey colour, with a single black elongated rhomboidal mark in the centre of the posterior part. It is about the same size as *A. albicincta* (about 3 mm.,  $1\frac{1}{2}$  lin.), and is also rare.

#### A. RADICUM, Linn.

This excessively common little fly, which, as its name imparts, feeds in the larva state upon the roots of plants, especially on those of the cabbage tribe, is often confounded with other species. It may be recognised by its projecting epistome; by the unequal sized scales; by the thorax being black and marked in the male by two short, grey, narrow stripes (rather than by three wide black ones, as is usually stated); by the rather short, wide, somewhat pointed abdomen, with a longitudinal dorsal black mark, crossed by three transverse straight black lines, extending of an even width to the margins; and by the third and fourth longitudinal veins of the wings being slightly convergent at their extremities.

#### A. SULCIVENTRIS, Zett.

This species bears a good deal of resemblance to *A. radicum*, but is less; has the antennæ much shorter; the arista more pubescent; the thorax without any distinct stripes on the dorsum, only having an irregular white line on each side; and the abdomen less pointed, and thicker at the apex as well as differently marked; it

being of a dull grey colour, with three transverse sulci on the dorsum, and a rather indistinct longitudinal black stripe, which appears in certain lights to be dilated into triangular spots, opposite the sulci or depressions. Common in pastures.

#### A. OCTOGUTTATA, Zett.

This little species (which only measures about  $2\frac{1}{2}$  mm.) also has considerable resemblance to *A. radicum*, being marked in a very similar way on the abdomen, by a longitudinal and three transverse stripes, which divide the surface into eight light grey square spots; the thorax, which is black, has also two short white stripes on its anterior parts: it differs, however, from *A. radicum* in having both the face and epistome less prominent, the third and fourth longitudinal wing veins quite parallel at their extremities, the abdomen narrower, sub-cylindrical, more hairy, and furnished with two projecting lamellæ beneath the apex in the male, which is but little thickened; the alulets are also smaller in proportion than in *A. radicum*, but still have the scales slightly uneven in size.

I have only seen one male specimen of this rare little fly, which I captured near Bradford in July, 1875.

(To be continued).

(V. L. with J. 1875)

#### A LIST OF THE BUTTERFLIES CAPTURED IN BARRACKPORE PARK DURING THE MONTHS OF SEPTEMBER, 1880, TO AUGUST, 1881.

BY G. A. J. ROTHNEY.\*

Barrackpore is situated on the right bank of the river Hoogly, 16 miles above Calcutta. The park comprises a strip of land on the river-bank some two miles long by about 1200 yards broad. Insect life, in the way of butterflies, commences to be active about March, and increases till May, when there is a slight lull till the rains commence about the 15th or 20th June. Insects are then very plentiful till the end of August, when another lull occurs till about the breaking up of the rains—the end of September, or first week in October—when the collecting season finishes up with a fine burst of life, lasting to about the 20th October; after which insects gradually disappear, few butterflies, &c., being seen after the end of that month. The flowers most frequented by butterflies in the park are: *Duranta Plumieri*, *Quisqualis indica*, *Poinciana pulcherrima*, *Mussaenda macrophylla*, and a tree with a small white hanging blossom (name not known), but the first-named is by far the most attractive.

#### EUPLEINÆ.

*Linna's Chrysippus*, Linn., *Salatura Genulia*, Cram., *Tirumala Linniacæ*, Linn., very common. March to October. Heavy, lazy flight.

*Parantica Aglea*, Cram., rare.

\* Communicated (with description of a new species, by Frederic Moore.

*Crastia Core*, Cram., very common. March to October. Heavy, lazy flight. Frequents the shade of Banian trees, &c. Very fond of settling on damp ground. Frequently taken *in coilu*.

[*Isamia Rothneyi*, Moore (n. sp.), male. Upper-side olive-brown; basal area darkest: fore-wing with a sub-marginal row of small whitish spots, and a marginal row of smaller spots, both rows decreasing in size towards the costa; sericeous streak short and broad: hind-wing with a pale flesh-coloured discoidal patch; a sub-marginal row of oval, and a marginal row of smaller, whitish spots. Expanse,  $3\frac{1}{2}$  inches.

In colour and pattern of markings, this interesting new species resembles the very common *C. Core*, for which insect Mr. Rothney mistook it. One specimen only occurs in this collection, and it is the only example known to me. Its nearest ally is a Ceylon species (*I. Sinhala*).—F. Moore.]

#### SATYRINÆ.

*Lethe Europa*, Fabr., one specimen only captured.

*Melanitis Ismene*, Cram., common, but difficult to catch. Found in shade, either under bamboo or under mangoe topes. When disturbed is fond of settling in cactus hedges.

*Calysime Samba*, Moore, *Blasius*, Fabr., *Drusia*, Cram., *Perseus*, Fabr., *indistans*, Moore, common. Fond of shade. Settle mostly in long grass.

*Elymnias undularis*, Drury, male common; female rare. Settles in dense foliage, close to the trunk.

#### NYMPHALINÆ.

*Charaxes Fabius*, Fabr.

*Symphædra Nais* (*Thyelia*, Fabr.). Two specimens only captured.

*Discophora Zal*, Westw., rare. Fond of shade.

*Precis Laomedea*, Linn., not common.

*Junonia Orithya*, Linn., rare; *Enone*, Linn., rare; *Lemonias*, Linn., *Asterie*, Linn., *Almana*, Linn., common, from early March to end of October. Fond of the sun and flowers.

*Ergolis Ariadne*, Linn., *Merione*, Cram. Habits as above.

*Limenitis Procris*, Cram., rare.

*Neptis Varmona*, Moore, *Kamarupa*, Moore, common, but difficult to capture. Fond of the sun.

*Apatura Bolina*, Linn., *Jacintha*, Drury, *Misippus*, Linn., not uncommon. Habits much the same as in the European Purple-Emperor, except that they are contented with a lower perch.

*Atella Phalanta*, Drury, common, from early May to September.

*Cirrochroa Anjira*, Moore. One ♀ specimen only captured (Identical with the Andaman type).

#### ACRÆINÆ.

*Telchinia violæ*, Fabr. A hot season insect; delights in the sun. Not common.

#### ERYCINIDÆ.

*Abisara suffusa*, Moore. May to October. Not common.

#### LYCÆNIDÆ.

*Anops Thetys*, Drury. Single specimens may be taken from May to September.



## ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(continued from p. 33).

## 19. CHORTOPHILA, Macq., Rond.

*Anthomyia*, p. Meig., Schin., Walk.*Aricia*, p. Zett.*Hylephila*, p. Rond.*Hammomyia*, p. Rond.

*Gen. ch.*—Eyes bare, contiguous, sub-contiguous, or sub-remote, in the males, approximate or remote in the females; arista pubescent or bare; face more or less prominent; abdomen mostly cylindrical in the males; alulets with small equal-sized scales; wings with the anal veins prolonged to the margin; legs black.

## Sect. 1—Forehead and face very prominent (buccate).

1. BUCCATA, Fall.

3. ALBESCENS, Zett.

2. UNILINEATA, Zett.

*albula*, Meig.

4. ARENOSA, Zett.

## Sect. 2—Forehead and face but slightly prominent.

5. IMPUDICA, Rond.

8. CINERELLA, Fall.

*varicolor*, p. ? Meig.*pusilla* ?, Meig.

6. TRAPEZINA, Zett.

9. SEPIA, Meig.

7. CINEREA, Fall.

10. BILLBERGI, Zett.

All the species in the first Section appear to be parasitic upon wild bees, and are, therefore, generally found in the vicinity of their burrows or nests.

## C. BUCCATA, Fall.

This, the typical species of the group, has the face very prominent, of a silky-white or yellowish colour. The eyes are sub-contiguous in both sexes, though slightly wider apart in the females than in the males. The antennæ are small and short, especially in the females; the third joint being but slightly longer than the second. The arista is thickened at its base, almost bare in the males, but pubescent in the females. The thorax is whitish-grey, with the sides almost white; it is indistinctly striped. The abdomen is whitish-grey with black reflections, and an interrupted longitudinal dorsal stripe; it is cylindrico-conical, with small inflexed pale grey anal segments in the male, and ovoid, with pointed apex, in the female. The wings have the external transverse veins oblique, and slightly sinuous. The legs have the posterior tibiæ almost bare on their inner sides.

This species is of local occurrence. I captured several in May, 1881, on a piece of rocky ground at Silverdale, in Lancashire, near the burrows of some wild bees. I caught two of the bees while entering their holes, and on submitting them to Mr. Bridgman, he kindly named them as *Andrena albicans* and *Andrena fulva*.

*C. UNILINEATA*, Zett.

This species closely resembles the last; it is usually, however, rather smaller and more slender. The eyes are rather more widely separated in the males and much further apart in the females than those of *A. buccata*; the space between them in the latter sex being equal to about one-fourth of the width of the head. The transverse veins of the wings are usually very sinuous, especially in the males; and the hind tibiæ of the same sex are furnished with a tuft or series of soft hairs in the middle of their inner sides.

Not common. I captured both sexes in 1875, at Powdon, in Cheshire, while on a visit to my friend, Mr. B. Cooke, and I have also received specimens from his own collection.

*C. ALBESCENS*, Zett.

This species resembles the two preceding ones in form and colour; it is, however, usually of a much smaller size, though it varies greatly in magnitude. There appear to be two distinct varieties, one as large again as the other; the former measuring 5 to 6 mm. ( $2\frac{1}{2}$  to 3 lin.), and the latter only about 3 mm. The chief characteristic feature is the sub-plumose arista, on account of which Rondani placed it in a distinct genus (*Hammomyia*). The position of the eyes is much the same as in *C. unilineata*, but they are usually rather more widely separated in both sexes than in that species. The legs have the fore tibiæ ciliated along their outer sides with short hairs, in the males of the larger variety; and the hind tibiæ are also furnished with soft hairs on their inner and front sides.

Found in sandy places, but not common.

*C. ARENOSA*, Zett.

This well-marked little species is rather aberrant in its characters, for while it has the face very prominent, and resembles in its general features and habits the other species in this section, it differs from them all by having the abdomen depressed or flattened at the base, but thickened at the apex by the presence of large sub-anal male appendages. The eyes of the males are sub-contiguous, and those of the females widely separated. The hind tibiæ of the former are armed along the whole length of their inner sides with rigid hairs or bristles of moderate and even length. The colour, especially on the thorax, is very pale, almost white.

Rare or rather local. It chiefly frequents marine sand-hills. The only specimens that I have seen were given to me by Mr. B. Cooke, and were taken by him at Southport, in Lancashire, where it is not uncommon.

*C. IMPUDICA*, Rond.

This species is characterized by the males having two large sub-ventral lobes on the penultimate segment of the abdomen, armed with minute black spines, and with a reddish spot at their base. The eyes are sub-contiguous in the males, and widely separated in the females. The thorax is bristly, of a darkish grey colour, with a central and two narrow irregular lateral black stripes; the sides are cinereous. The abdomen is hairy, light grey, with an interrupted longitudinal dorsal stripe; the portions of which are often dilated into triangular spots. The legs are furnished with many hairs and bristles, but the hind tibiæ have few or none on their inner

sides. The females have the thorax and abdomen coloured and marked in a similar manner to those of the males, the latter part is conical with a pointed apex.

Generally distributed.

Size, from 6 to 7 mm. (about 3 lines).

I believe that this species has been confounded with *C. varicolor*, Meig., a British specimen of which I have not yet seen. The latter (of which I possess a typical example named by Rondani) has the abdomen laterally compressed, and destitute of the large sub-anal lobular appendages.

### C. TRAPEZINA, Zett.

This bears a considerable resemblance to *C. impudica*, but is darker in colour than that species, less hairy, has the abdomen of the male more depressed (less cylindrical), with smaller ventral lobes without a red spot at their base, and is marked along the dorsum with a series of triangular or sub-quadrate black spots. The thorax has three black stripes, which are nearer together than those in *C. impudica*, and there are often two lateral ones in addition.

The hind tibiæ of the males are armed with three or four bristles in the middle of their inner surfaces.

The female is lighter in colour than the male, and often has both thorax and abdomen almost immaculate.

Not uncommon.

### C. CINEREA, Fall.

This species is characterized by its grey colour and almost immaculate thorax. The face is rather prominent, that of the female being more so than that of the male. The abdomen in the latter sex is sub-cylindrical, somewhat flattened, clothed with numerous black hairs, and showing dark reflections when viewed in some directions; it has also a narrow sub-interrupted dorsal stripe, and tapers a little towards the apex, which is round, projecting, and of a grey colour, with two hairy lobular appendages on its under-surface. The legs are long and spinose; the hind tibiæ of the males being armed along their inner sides, for nearly their whole length, with a series of short stiff hairs, of sub-equal lengths.

The female has the thorax often marked on its front margin with two narrow brown stripes, placed near together. The abdomen is conical, pointed, mostly unstriped, and closely resembling in shape that of the female of *Hydrophora conica*.

The length of this species is usually from 7 to 8 mm. (3 to 4 lin.), the females being mostly the larger. It is not uncommon; the females are much more frequently seen than the males, and are often noticed on the flowers of *Chrysanthemum leucanthemum* (the ox eye).

### C. CINERELLA, Fall.

This little species has the thorax and abdomen coated with grey dust-like scales (*cinereo-farinosus*); the former is indistinctly striped, except by four dorsal rows of small black bristles; and the latter, which is cylindrico-conical in the males, is marked by a central dorsal line of small triangular spots. The hind femora, as pointed out by Rondani, are destitute of bristles on the basal half of their under-surfaces, and the hind tibiæ are bare on their inner sides.\*

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\* Rondani also observed that the epistome is very prominent.

I believe this species to be identical with the *A. pusilla* of Meigen and Schiner. It is not the same as the *A. cinerella* of Meigen, which belongs to the genus *Hylemyia*.

It is not common.

### C. SEPIA, Meig.

This small dark fly is characterized by being rather short and thick, with shortish wings, which are nigrescent at the base. It is hairy, with the thorax dark grey, having a central black stripe, which is sometimes indistinct. The face is rather prominent, and the eyes of the males are sub-contiguous. The abdomen in the same sex is black, hairy, thick, and cylindrical, with the apex large and inflexed, having two projecting sub-anal hairy lamellæ. A wide interrupted dorsal band, formed by large sub-quadrate black spots, may be seen in certain lights. I have not seen the female.

This species is usually found in corn-fields, but is not very common; Rondani says that the larvæ live in the culms of wheat and other graminaceæ.

### C. BILLBERGI, Zett.

This is an aberrant species, the generic position of which it is rather difficult to determine. Schiner places it along with its congener, *M. sylvestris*, Fall. (of which I have not seen a British example) in the genus *Eriphia* of Meigen. Another genus, of which it possesses many of the characters, is *Pogonomyia* of Rondani; it does not possess, however, the distinctive points assigned by the latter author to the species placed in either of the above genera, for it has the scales of the alulets very small and equal in size, and the anal veins prolonged to the margin of the wings. In the face of these difficulties I have thought it best to place it, at least provisionally, in the present genus.

It may be known by its black colour, its rather elongated form, the approximation of the eyes in both sexes, and the dilatation of the second and third joints of the fore tarsi in the females. The face and epistome are both rather prominent, and the latter is furnished with numerous bristles. The eyes are sub-contiguous in the males, and only slightly more separated in the females. The antennæ are rather short, with the second joint setose; the arista is bare and thickened at the base. The thorax is of a shining blackish-grey colour, with whitish shoulders and sides. The abdomen in the male is cylindrico-conical, hairy, cinereous, with a central dorsal longitudinal black stripe; it has the apex rounded, projecting, shining black, hairy beneath, and furnished with two moderate-sized sub-anal lamellæ. In the female the abdomen is black, shining, immaculate, rather depressed, and with a pointed apex. The legs of the female are peculiar in having the second and third joints of the fore tarsi somewhat dilated.

Zetterstedt appears to have confused the sexes together, for he says, "Abdomen in utroque sexu ovato-lanceolatum, sub-depressum apice acutum," which only applies to the female, and he has made the mistake of attributing the possession of the dilated tarsal joints to the male, an error into which Schiner has also fallen.

This is an Alpine species. I found several specimens of both sexes in May, 1875, in the woods upon the summit of one of the lofty hills surmounting the ruins of Bolton Abbey, in Craven, Yorkshire.

(To be continued).

Mr. Meyrick sent an elaborate memoir on the classification of the *Tineina*, in which he attempted to shew that schemes based upon European forms only, will not bear the test of scrutiny, when applied to those of Australia, New Zealand, &c. He also dwelt largely on the importance of structural characters in *Lepidoptera*, as opposed to those ordinarily taken from markings, &c.

January 17th, 1883.—Anniversary Meeting. The President in the Chair.

It was announced that the prize of £50, offered by Lord Walsingham, for the best essay on *Sclerostoma syngamus* (see notice of meeting for October 1st, 1879, vol. xvi, p. 140), had been awarded to Dr Mégnin, of Paris (two competitors); no essay regarding *Strongylus pergracilis* had been received.

The following were elected Members of Council for the ensuing year, viz.:—J. W. Dunning, M.A., F.L.S., E. A. Fitch, F.L.S., F. D. Godman, M.A., F.R.S., Rev. H. S. Gorham, F. Grut, F.L.S., W. F. Kirby, R. McLachlan, F.R.S., J. W. May, K.N.L., F. P. Pascoe, F.L.S., E. Saunders, F.L.S., J. W. Slater, H. T. Stainton, F.R.S., and C. O. Waterhouse.

The following officers were subsequently elected, viz.:—President, J. W. Dunning; Treasurer, E. Saunders; Secretaries, E. A. Fitch and W. F. Kirby; Librarian, F. Grut.

The outgoing President read an address, which was ordered to be printed, and the meeting terminated with the usual votes of thanks to the officers for their services during the past year.

## ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(continued from p. 148).

20. PHORPIA, R. Desv. = *Chortophila* (Rond.) f. Meig.

*Anthomyia*, p. Meig., Schin., Macq., Walk.

*Aricia*, p. Zett.

*Chortophila*, p. Macq., Rond.

*Gen. ch.*—Eyes bare, contiguous or sub-contiguous in the males, remote in the females; arista tomentose or bare; face slightly prominent; abdomen depressed, oblong, or linear; alulets small, with equal-sized scales; wings with the anal veins prolonged to the margin; legs black.

1. FLOCCOSA, Macq., Rond.

*floralis*?, Fall.

2. TRANSVERSALIS, Zett.

3. PUDICA, Rond.

4. DISSECTA, Meig.

5. INCOGNITA, Rond.

6. LACTUCE, Bouché.

7. OBSCURA, Macq.

8. MUSCARIA, Meig.

*brevicornis*?, Zett.

9. HISTRIO, Zett.

10. CILICRURA, Rond.

*fusciceps*?, Zett.

11. TRICHODACTYLA, Rond.

12. FLORILEGA, Zett.

13. IGNOTA, Rond.

14. CEPETORUM, sp. n.

*ceparum*?, Meig.

*antiqua*, p. Schin.

15. NEGLECTA, sp. n.

16. EXIGUA, sp. n.

*parva*?, Desv., Macq.



This genus contains a rather heterogeneous collection of small flies, including all those black-legged species whose males have contiguous eyes, which cannot be placed in any of the preceding genera.

Several small species are embraced in this group which are very difficult to determine, as they are very much alike, and do not possess any very marked distinctive characters. Several different species have, I believe, been described under the same name, and I think that the same species may have been described under different names; so that it is very difficult to arrive at just conclusions. The females of distinct species are, in some cases, so similar, that it is almost impossible to name them correctly, unless they are found associated with the corresponding males.

#### P. FLOCCOSA, Macq.

The males of this common species may at once be recognised by the tuft of hairs on the under-side of the base of the hind femora, and by the inner sides of the hind tibiæ being ciliated along the middle part of their inner surfaces with a series of short bristles of unequal lengths. There is but little doubt that this species is the same as the *M. floralis*, of Fallén, Meigen, Zetterstedt, Schiner, and others; for the general descriptions of both species agree together, though none of the last-named authors mention the tufted femora. The face is rather prominent; the eyes (of male) sub-contiguous; the arista pubescent; the thorax marked with three rather broad and widely separated stripes; the abdomen narrow and rather tapering, with a wide, black, dorsal, longitudinal stripe, which becomes narrower towards its extremity, and is more or less dilated opposite the upper margin of each segment, which is marked with a narrow, transverse, black line. The female has the eyes separated by a white, intra-ocular space, occupying about a third of the width of the head, containing a wide central stripe, usually red at its front part, and black behind; but sometimes entirely black. The thorax and abdomen are both lighter in colour than in the male, and are indistinctly striped; the latter is oblongo-ovoid in shape, with the apex pointed.

The larvæ feed upon the stems of cauliflowers and other varieties of the cabbage tribe. I have received specimens of the fly from Mr. Inchbald, bred from the first, and I reared several myself last summer from cabbage plants sent to me by Mr. Dunn, of Dalkeith, in consequence of their being infested with the "grubs of the cabbage-fly."

The larvæ of *A. floralis* are said, by Zetterstedt and Schiner, to feed upon radishes (*Raphanus sativus*), and Winnertz has bred this fly from the roots of *Brassica napobrassica*.

#### P. TRANSVERSALIS, Zett.

This species has the abdomen oblong, flattened, rather short, covered with soft hairs, and marked along the dorsum with a widish, longitudinal, black band of even width, interrupted opposite the edges of the segments, which are bordered by a whitish line. The thorax is very dark grey, marked with three indistinct, longitu-



dinal, black bands, and has light grey sides. Zetterstedt says that the alulets are "*sordide albide*," but I have found both these and the halteres to be usually of an orange colour.

This is rather a local species. I have found it abundantly in a plantation near Bradford, and have received specimens from Mr. Inebald, which he had bred from the leaves of *Rumex acetosa*, which are mined, or, rather, blotched, by the larvæ.

#### P. PUBICA, Rond.

This is a pretty, bright-looking fly, about the same size as the last (6 mm. long), but having the abdomen rather more elongated and pointed. The thorax is of a glistening whitish-grey colour, lighter on the front margin and on the shoulders; it is marked by a central black stripe, which only extends along the anterior half, and by two very wide lateral bands, which reach the bases of the wings. The abdomen is of a slight pinkish-grey colour (sometimes glaucous), with a slender, continuous, tapering, longitudinal, black stripe.

The sub-anal male appendages are small. The hind tibiæ are armed with a few bristles towards the upper part of their inner sides. I do not know the female.

Not uncommon.

#### P. DISSECTA, Meig.

This rare species is characterized by having yellowish-brown wings, sub-contiguous eyes (in the male), a nearly bare arista, a dull, dark grey thorax, with cinereous shoulders, and three, rather indistinct, black stripes, an oblong, flattened, rather narrow, abdomen, of a light grey colour, clothed with numerous soft hairs, and marked with an interrupted dorsal black stripe, formed by four triangular spots, the bases of which are dilated into transverse bands opposite the upper edge of each segment. It has straight, perpendicular, external, transverse veins to the wings, and the male hind tibiæ are armed with a few short bristles of uneven lengths in the middle of their inner sides.

I have not seen a female.

I captured one male at Thorparch, near York, in August, 1878, another at Silverdale, in Lancashire, in May, 1881, and a third near Bicester, Oxon, in June, 1882.

#### P. INCOGNITA, Rond.

This species, of which I have only seen one British male example, captured by the late F. Walker, closely resembles *P. dissecta* by its brown wings and other general characters, but differs by having a more pubescent arista, narrower cheeks, a more nigrescent thorax, and a narrower abdomen, which is marked with much larger triangular spots, which cover the greater part of the dorsum.

I possess a typical continental male specimen which was named by the late Professor Rondani. I do not know the female.

#### P. LACTUCE, Bouché.

This species is of a deep rich brownish-black colour with brown wings. The eyes of the male are contiguous, with the frontal triangle red; the arista is pubescent: the cheeks rufous; the thorax with a cinereous tinge on the shoulders and sides; the abdomen is oblong and flattened, of an uniform brown colour, when

viewed from before backwards; but looking of a grey colour with brown reflections, and having an interrupted dorsal stripe, when seen from behind.

This pretty, well-marked species is said to feed, in the larval state, on the lettuce. It appears to be of rather local occurrence. The only place in which I have found it has been a kitchen garden near Buckingham, where I captured several males on several occasions. I have not seen a female.

#### P. OBSCURA, Macq.

The thorax of this species is black, with the front margin and shoulders glistening greyish-white. The anterior edge is intersected by three, and sometimes four (when the middle one is bifid), abbreviated black stripes, which form two or three irregular, bright, white, spots, giving a peculiar and characteristic appearance to the fly. The abdomen is oblong, rather narrow, flat, and glabrous. It is grey, with a wide, interrupted, black, dorsal stripe, and has three straight, transverse, brown bands, which cover the upper halves of the second, third, and fourth segments. The length is about 4 mm. (2 lin.).

Very rare; I have seen but one male specimen, which I captured near Bradford, in June, 1879.

#### P. MUSCARIA, Meig.

This is characterized by being narrow, elongated, black, and hairy. The face and epistome are both prominent; the antennæ are very short, the second joint being almost as long as the third, which is short and wide; the palpi are long, hairy, and dilated at their extremities; the thorax and abdomen are indistinctly striped; the latter is very narrow, and thickly clothed with long hairs; the hind femora are very hairy, but the hind tibiæ are bare on their inner sides. These remarks apply to the male, I do not know the female.

Very rare.

#### P. HISTRIO, Zett.

This, and the two following species, are peculiar by having the hind tibiæ of the males ciliated along the whole length of their inner sides with short erect hairs or bristles. The present fly, which is considerably larger than either of the two following (it being from 7 to 8 mm. in length) has the arista decidedly pubescent; the thorax whitish-grey, marked with a black central stripe (bifid in front), and with two wide, irregular lateral bands. The scutellum has the edges, and sometimes the centre, marked with brown. The abdomen is oblongo-conical, with the apical segment small. It is marked with a narrow, black, longitudinal stripe, as well as with black transverse lines. The wings have the external transverse veins oblique and sinuous. The hind femora are nearly bare of hairs on their under surfaces; and the hind tibiæ have the bristles arranged in a double row along both their inner and front sides; the bristles being of slightly irregular lengths.

This rare species, of which I only know the male, approaches in form, and by its pubescent arista, to those Anthomyids placed in the genus *Hylemyia*.

#### P. CILICRURA, Rond.

This little species, 4 to 5 mm. (about 2 lines) in length, is of a dark brownish-grey colour, marked on the thorax with three rather indistinct, wide, brown, longi-

tudinal lines. The abdomen is flat and tapering, having a central, longitudinal, black, dorsal stripe, as well as transverse dark lines on the borders of the segments; the latter being only visible in certain lights. The anal segment is small and grey, and the sub-anal appendages of moderate size. The face and epistome are often rufescent, and are both slightly prominent; the eyes are sub-coherent in the male, and widely separated in the female; the latter having the intra-ocular space red at the fore part; the row of bristles on the inside of the hind tibiæ of the male consists of short rigid hairs, placed very near together, and of almost equal lengths. The female has the thorax of a paler brown colour, and is indistinctly striped.

This little fly is generally distributed, and feeds, in the larva state, upon onions. I bred a number of specimens of both sexes last summer, from onion plants, in different stages of growth, which had been kindly sent to me by Miss Ormerod, as well as by Mr. Dunn, of Dalkeith, in consequence of their being infested by the maggots or larvæ of *Diptera*, which were injurious to the onion crops.

I have placed the *A. ruficeps*, of Zetterstedt, as a synonym of *P. cilicrura*, though Rondani thinks that it agrees more closely with *A. angustifrons*, of Meigen; the latter species, however, has a decidedly prominent face, and Zetterstedt says of *A. fusciceps*, "frons parum prominula." The hind tibiæ, again, in *A. angustifrons* (a typical continental specimen of which, named by Rondani, I have had an opportunity of examining), are furnished with much longer and softer hairs than those of *P. cilicrura*; and Zetterstedt says of *A. fusciceps*, "tibiæ posticæ intus pube brevi erecta ciliatæ." I have not seen a British specimen of *A. angustifrons*. I formerly confused it with *P. cilicrura*.

#### P. TRICHODACTYLA, Rond.

This species very closely resembles *P. cilicrura*, but is usually rather smaller, of a lighter grey colour, and has the thorax less distinctly striped, being often immaculate. The abdominal dorsal stripe is generally interrupted, the separate portions having a triangular shape. The hind tibiæ of the males are armed exactly like those of *P. cilicrura*, but the middle legs present a very characteristic difference, the metatarsal joints being furnished on their outer sides with four or five long curved hairs or bristles. I only know the male.

This little fly is not uncommon, but less frequently seen than the preceding one.

#### P. FLORILEGA, Zett.

This species closely resembles *P. trichodactyla* in form, colour and design, but has the middle metatarsal joints of the males destitute of long hairs, and the inner surfaces of the hind tibiæ unarmed, with the exception of having two or three short bristles at their upper part. It is about 3 mm. in length, has both the face and epistome slightly prominent, the eyes of the male contiguous, the arista bare, the thorax yellowish-grey, marked with three indistinct brown stripes; the abdomen flat, narrow and tapering, with very small anal and sub-anal appendages; cinereous in colour, and marked with a sub-continuous dorsal stripe, which is quite straight, and of uniform width throughout. I do not know the female.

Not uncommon.

#### P. IGNOTA, Rond.

This is a well-marked little species, very common in gardens and fields. It is

usually of a shining black colour; the males have large contiguous eyes which nearly cover the whole cheeks; the thorax is mostly immaculate, but in the less deeply coloured specimens three wide black bands may be observed on a brown ground; the abdomen is flat and tapers towards the extremity, when viewed from behind it is grey, having often a glaucous tinge, and is marked with a black longitudinal sub-continuous dorsal band, and with straight transverse lines; the wings are usually somewhat fuscous, having the third and fourth longitudinal veins rather widely separated, and slightly divergent from each other; the external transverse veins are straight and upright; the hind tibiæ of the males are bare on their inner sides.

The female is grey, with the thorax and abdomen indistinctly striped; the eyes widely separated, and the intra-ocular space black, with broad whitish margins.

*P. CEPETORUM, sp. n.*

*Mas, griseus, thorace sublineato; abdomen lineare, depressum, cinereum, albonitente, linea dorsali nigra, interrupta, signatum; alæ clare; tibiæ posticæ intus parce setosæ.*

*Femina, oculis remotis, abdomine immaculato, apice acuto.*

*Long. ♂ et ♀, 6 mm.*

This species very closely resembles *Hylemyia antiqua*, Meig., and has doubtless been confounded with it. The chief points of difference between the two species are, that the arista is only pubescent in *P. cepetorum*, but sub-plumose in *H. antiqua*; the abdomen is marked down the dorsum with an interrupted stripe in *P. cepetorum*, while there is a fine continuous line in *H. antiqua* ("ununterbrochener schwarzer feiner Rückenlinie");\* lastly, the wings are mostly clear in *P. cepetorum*, but brown in *H. antiqua*.

*Head*: face slightly prominent; epistome flat; eyes of male contiguous; antennæ of moderate length, with the arista thickened and pubescent at its base, but nearly bare in the middle and at the extremity.

*Thorax*, with the scutellum of a light yellowish-grey colour; the former marked with four indistinct pale brown stripes, and with four rows of black bristles.

*Abdomen* oblong and rather narrow, cinereous, clothed with black hairs, and showing silvery-white reflections when viewed from behind; it is marked down the dorsum with a row of elongated, narrow, triangular black spots, which form a sub-continuous stripe; the anal segment is grey, small and rather pointed; the sub-anal male appendages are large and hairy.

*Wings* hyaline, with the third and fourth longitudinal veins nearly parallel to each other, and the external transverse ones straight, and a little oblique; *Calyptra* and *Halteres* both pale yellow; *Legs* sometimes piceous; hind femora almost bare of hairs or bristles at the base of their under-surfaces; hind tibiæ of the males furnished with a few short bristles along the middle and upper part of their inner sides. The female is very similar in colour to the male; the eyes are widely separated, the intervening space being red at its front part; the abdomen is dull grey, mostly immaculate, conical and pointed at the apex; the calyptra are white, and the halteres yellow.

\* Meigen.

This is "*par excellence*" an onion fly, as all the specimens which I have seen have been bred from the bulbs of that vegetable. I suspect it is the same as that named *A. ceparum* by Bouché, Meigen, and others, which has been mixed up by Schiner with *H. antiqua*.\*

I received specimens of this species last summer from Mr. Inelbald, which he had bred from onions, and I also reared several myself from bulbs of the same onions (sent by Miss Ormerod) which produced the specimens of *P. cilicrura*; the larvæ of both species feeding together, and passing through their transformations at the same time. It is very interesting to add, that a short time since I received both males and females of this fly from Professor Lintner of Albany, U. S., which he had bred from onions in America, and which corresponded in all respects with my English specimens, with the exception of having the legs more piceous or testaceous in colour.

*P. NEGLECTA, sp. n.*

*Mas, fuscus, pilosus; thorace lineis quinque striato; abdomine angusto, maculis tribus triangularibus, dorso signato; alis venis tertiis quartisque longitudinalibus versus apicibus paulo convergentibus; tibiis posticis intus nudis. Long. 3 mm.*

*Head:* eyes large, covering the cheeks, and closely contiguous; face and epistome only slightly prominent; antennæ rather elongated, the third joint being three times the length of the second; arista thickened along its basal third, where it is almost bare, but having the apical portion a little pubescent.

*Thorax,* with scutellum, grey, sometimes having a glaucous tinge; it is marked down the dorsum with five stripes, of which the middle and two lateral ones are the widest, the intermediate lines being narrow and sometimes indistinct, when only three broad stripes are visible.

*Abdomen* narrow and pointed towards the apex, covered with numerous soft black hairs, and consisting of four distinct segments, of which the first is very short, the second longer than any of the others, and the third and fourth about equal in length; it is of a dull grey colour, and marked down the dorsum with three large triangular black spots, the bases of which are transversely dilated opposite the upper margins of the second, third, and fourth segments; the apical joint is very small and pointed, and furnished on its under-surface with two small lamellæ, on the outer side of each of which a small black hook or tooth may be observed, projecting backwards.

*Calyptra* moderately developed, of a dull yellowish-white colour; *Halteres* orange-yellow.

*Wings* slightly nigrescent, costal spine wanting; costal vein ciliated at the base; external transverse vein straight and upright; third and fourth longitudinal veins diverging from the site of the internal transverse vein, for three-fourths of the distance to the apex of the wing, and then becoming slightly convergent towards each other; the third longitudinal vein reaching the border exactly at the apex. *Legs,* with the under-surfaces of all the femora, ciliated with a double row of long fine bristles; inner sides of hind tibiæ bare. The female is unknown to me.

This little well-marked species is generally distributed, but not common.

\* In a former part of this list I placed *A. ceparum*, Meig., under *Hylemyia tibiaria*, Rond., but I now believe that I was mistaken in thinking that they were synonymous.







## ANNOTATED LIST OF BRITISH ANTHOMYIDÆ.

BY R. H. MEADE.

(Continued from Vol. xix, page 220).

## 21. ACANTHIPTERA, Rond.

*Pegomyia*, Macq.*Anthomyia*, Meig., Schin.*Anthomyza*, Zett.

*Gen. ch.*—Head nearly semi-circular; eyes bare, approximate in both sexes; arista long and pubescent; alulets well developed, the lower scale being considerably longer than the upper; abdomen elongated, tapering, and sub-cylindrical in the male, ovato-conical in the female: wings with auxiliary vein armed with spines, and anal vein not reaching the margin: legs yellow, elongated (especially in the males), and with large pulvilli.

## A. INANIS, Fall.

Only one European species is known in this rather peculiar genus; it has the head similar in shape to those in the genus *Homalomyia*. The colour is totally yellow, with the exception of a bluish-grey spot on the dorsum of the thorax, and the joints of the tarsi, all of which are nigrescent in the females, but only those of the hind legs in the males. Not common. The larvæ are said to have been found in wasps' nests.

## 22. PEGOMYIA, Desv., Macq.

*Anthomyia*, Meig., Schin., Rond., p.*Anthomyza*, Zett.*Chortophila*, p., Rond.

*Gen. ch.*—Eyes bare, contiguous or sub-contiguous in the males, remote in the females; arista pubescent or bare; abdomen sub-cylindrical or depressed in the males, ovato-conical in the females; alulets variable in size, mostly small, but sometimes with the scales pretty well developed and of unequal lengths: wings with the anal veins prolonged to the margin: legs always partly yellow, and abdomen mostly wholly or partially so, as well.

Sect. 1—*Abdomen wholly or principally black or grey.*

1. BETÆ, Curtis.

*sulcans*?, Rond.

2. CONFORMIS, Fall.

3. HYOSCYAMI, Panz.

*chenopodii*, Rond.

4. HÆMORRHUUM, Zett.

Sect. 2—*Abdomen red or yellow.*Div. i.—*Alulets moderate in size, with scales of unequal length.*

5. RUFIPES, Fall.  
6. WINTHEMI, Meig.

7. TRANSVERSA, Fall.  
8. LATITARSIS, Zett.

Div. ii.—*Alulets small, with equal sized scales.*

9. BICOLOR, Wdm.  
*mitis*, Meig.  
*strigipes*?, Zett.  
10. NIGRITARSIS, Zett.  
*fulgens*, Schin., non Meig.  
11. EXILIS, Meig.

12. VERSICOLOR, Meig.  
13. FLAVIPES, Fall.  
14. VITTIGERA, Zett.  
*gilva*?, Zett.  
15. ROTUNDICORNIS, Zett.

The flies included in this genus are some of them more highly developed than others, having larger alulets and wider bodies; Rondani, therefore, placed them partly in his genus *Anthomyia*, and partly in *Chortophila*; the greater number of them, however, have their principal characters in common, possessing yellow bodies and legs, and form a natural group: to these I have joined a few others which closely resemble some of those in the genera *Chortophila* and *Phorbia*, but differ in having the legs always partially yellow. R. Desvoidy formed this genus to include those flies which feed in the larva state upon the parenchyma of leaves; but though most of the species included in it do thus blotch or mine the leaves of various plants, the habit is not peculiar to them, for some of the species in the genus *Phorbia*, as I have already mentioned, do the same.

P. BETÆ, Curtis. = *Myoscytus* *betæ* Curtis.

The male of this species was well described by Curtis in the Journal of the Royal Agricultural Society of England in 1847;\* he overlooked, however, one important point, describing the palpi as being black, whereas they are always yellow with black ends or tips. The antennæ are wholly black; the femora and tarsi are all black in the males, the tibiæ only being yellow or piceous in dark varieties; in the females the femora of the four posterior legs are usually pale or yellow, while those of the front pair are black or grey on their upper surfaces.

This fly, which was formerly considered rare, and was but little known, has come into rather prominent notice of late years, owing to the injury which it causes in the larva state to the agriculturist, by feeding upon the leaves of the mangold wurzel. It also mines the leaves of other species of beet and *Chenopodium*, and Mr. Inchbald sent me specimens bred from spinach leaves.

P. CONFORMIS, Fall. = *Gonomyia* *conformis* Fall.

This species bears considerable resemblance to the last. The female only has been described, the male being unknown until I received a specimen in May, 1882, from Mr. Inchbald, together with a female, both of which he had bred from the

\* Vol. viii, pt. ii, p. 412.

leaves of *Arctium lappa*, upon which the larvæ had fed. The male bears a considerable resemblance to that of *P. betæ*: the face is rather prominent; eyes contiguous; antennæ rather short, entirely black; palpi yellow, with black tips; thorax dark grey, very indistinctly striped; abdomen narrow, sub-cylindrical, light grey, with a very slightly marked dorsal longitudinal stripe and large projecting sub-anal processes of a reddish colour; the fore legs have the femora and tarsi black, and the tibiæ only red; the four posterior legs have the femora, as well as the tibiæ, red. The female has the face more prominent than that of the male, and, together with the forehead, cheeks, and basal joints of antennæ, of a bright yellow colour. The thorax and abdomen are both immaculate and light grey; the legs have all the femora and tibiæ yellow. Rare: besides the pair which I received from Mr. Inchbald, I have two females which I captured at Windermere in 1874.

#### P. HYOSCYAMI, Panz.

In this species the abdomen is usually described as being of a light grey colour, especially in the male; but it will often be found to have a pale testaceous tinge in both sexes, when it corresponds to the *C. chenopodii* of Rondani. The back of the abdomen is marked with a longitudinal row of narrow triangular spots in both males and females, very similar to those seen in *P. betæ*. The palpi are yellow with black tips; the basal joints of the antennæ are yellow; and the legs have all the femora and tibiæ pale, with the exception of the fore femora in the male, which are partly grey. This rare species is said to feed in the larva state upon the leaves of the henbane, and Rondani says that he has bred the pale bodied variety from those of the deadly nightshade (*Atropa belladonna*), as well as from some species of *Chenopodium*.

#### P. HÆMORRHOUM, Zett.

The female of this species closely resembles that of *P. conformis*, but differs in having the last two segments of the abdomen red or yellow. The palpi are yellow with black tips; the antennæ are wholly black in all the specimens that I have seen, but Zetterstedt says that they are often red at the base; the fore femora are black or grey, but all the others, as well as all the tibiæ, are yellow. Zetterstedt only knew the female when he published his description in the 4th vol. of the Dipt. Scand.; but in the 14th and Supplementary volume of the same work he gives a very imperfect account of the male. In several specimens which I possess of that sex, the abdomen is sub-cylindrical, entirely grey, having dark reflections, but no distinct markings; the anal segment is incurved, grey, with two projecting processes of a black colour; the eyes are sub-contiguous; the forehead prominent; the antennæ wholly black as well as the palpi; the legs are coloured as in the female, but the fore femora are only black at their bases. This species is not uncommon near Bradford, but the females are more frequently met with than the males.

#### P. RUFIPES, Fall.

Only the male is known of this species, which is one of the most highly developed in the genus, the scales of the alulets being of considerable size, and the abdomen widened. The antennæ and palpi are black, the latter, however, being sometimes pale at their bases; the legs are entirely rufous, with the exception of

the tarsi, which are black; the fore femora are, however, often darker than the others (piceous). Rare. I have two specimens, one found near Bradford, and the other in Oxfordshire.

### P. WINTHEMI, Meig.

This species, like the last, has the alulets comparatively large. It is characterized by the abdomen, which is yellow, being marked on the lower edge of each segment by a transverse black line; the antennæ are black in the males, but have the two basal joints pale in the females; the palpi are yellow; the thorax is dark grey, the apex of the scutellum and the sides of the thorax being often tinged with yellow, especially in the females; the transverse veins of the wings are oblique and sinuous.

### P. TRANSVERSA, Fall. = *transversa*

This species closely resembles the preceding one; it differs from it, however, in having the alulets smaller, the scales being only slightly unequal, and in having the external transverse veins of the wings nearly straight and upright; the femora and tibiæ are all yellow in both species. These two flies, which are quite distinct, have been mixed together. Meigen, in his description of *P. Winthemi*, says, that the external transverse veins are straight and upright, but Schiner states that he had examined specimens obtained from Meigen, which all had the veins sinuous; he, however, thought that there was only one species, and that Fallen's *P. transversa* was the same as Meigen's *P. Winthemi*. Rondani also confounded the two species: his description of the male of *P. transversa* (he does not mention *P. Winthemi*) applying to that species, while that of the female belongs to *P. Winthemi*; for he says of the former, "vena transversa exteriore non rectissima," while he remarks of the latter sex, "alæ vena transversa exteriore distincte sinuosa." Both these species are rare, but I possess two males and two females of each.

### P. LATITARSIS, Zett. = *latitarsis*

I have not seen a male of this species, which closely resembles that of *P. transversa*. The females may be known at once by their having the tarsi of the four posterior legs widely dilated at their extremities. I have two specimens, both captured in Yorkshire.

### P. BICOLOR, Wdm.

This common species may be considered as the typical one of the group to which it belongs (those with small alulets). I will, therefore, briefly mention its leading features of distinction, so that it may be easy to note the characteristic points by which the following and nearly allied species may be distinguished from it. The forehead and face are somewhat prominent; the eyes of the male sub-contiguous; the seta bare; the antennæ usually with all three joints black, but sometimes with the first and second rufous; the palpi always entirely yellow; the frontal stripe usually black in the females, and always in the males; the abdomen of males sub-cylindrical; all the tarsi and the fore femora black in the males, the tarsi only black in the females. The larvæ of this species feed on the leaves of several of the common species of dock (*Rumex*), in which they make large blotches.

### P. NIGRITARSIS, Zett.

Rondani places this species in his genus *Anthomyia*, but in numerous examples which I have examined I have always found the scales of the alulets very small and equal in size. This closely resembles *P. bicolor* in shape, colour, &c., but differs in being usually rather smaller; in having black tips to the palpi; the eyes of the male contiguous; the frontal space mostly red in the males, and always brightly so in the females; and the fore femora always grey on their upper surfaces in the females. Schiner evidently confounds this species with *A. fulgens* of Meigen, but the latter (of which I have not seen a British specimen) has the scutellum yellow, not grey, as in *P. nigratarsis*. This fly also feeds in the larva state upon dock leaves; I have bred many specimens from those of *Rumex obtusifolius*. On one occasion, several individuals of this species, as well as some of *P. bicolor*, emerged from pupæ formed in the same leaf.

### P. EXILIS, Meig.

This closely resembles the two preceding species, but differs from them both by having the palpi entirely black; the antennæ have the basal joints yellow. Rare: I bred a single specimen last year from a leaf of *Heracleum sphondylium*.

### P. VERSICOLOR, Meig.

In shape and general appearance this species closely resembles *P. bicolor*, but may be distinguished from it by having the palpi entirely black; the antennæ are also black, by which it may be known from *P. exilis*. Not very uncommon.

### P. FLAVIPES, Fall.

This little fly differs from *P. bicolor*, as well as from most of the other preceding species, by having the forehead flat, and the abdomen thin and depressed, instead of being sub-cylindrical. It has the arista pubescent; the palpi yellow (sometimes darkened at the extremities); the thorax sub-testaceous; the abdomen livid, with large sub-anal processes; and the four posterior femora with black rings round their extremities. Rare: only the male has been described.

### P. VITTIGERA, Zett.

This species differs from all the preceding by having the thorax always pale, as well as the abdomen. The colour of the former varies from light yellow to rufo-testaceous, and it is marked down the dorsum with a broad grey stripe. This fly closely resembles *P. flavipes* in most points, having among others the posterior femora annulated with black at their extremities. Zetterstedt captured a female in union with a male of *P. flavipes*, and I am inclined to think that they are both varieties of the same insect. Rare: I captured a single female at Windermere in June, 1874.

### P. ROTUNDCORNIS, Zett.

This is an aberrant species, peculiar by having the eyes of the male, as well as those of the female, separated by a considerable interval. The antennæ are short, with the third joint orbicular, and with the seta elongated and bare; the thorax is



grey; the abdomen very narrow, depressed, and reddish-brown. Zetterstedt only knew the male; the female is very similar to it, but has the abdomen fusiform and the metatarsi yellow. A pair of this well marked and peculiar species were sent to me for identification by Mr. Dale, of Glanville Wootton in May, 1877.

(To be continued).

## REPLY TO MR. MEYRICK'S OBSERVATIONS ON THE SYNONYMY OF CERTAIN *MICRO-LEPIDOPTERA*.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

It is a truth which none will question, that no criticism of a man's work (however severe or unmerited) is so distressing as the ignoring of it altogether; and the distress, such as it is, is still more diminished when the critic bases his observations upon an unsound foundation.

When a man can say, as Mr. Meyrick cannot, that he has before him, as he writes, *the types*, or even *good figures*, of several so-called species, referred by their authors to different genera; and, that they are specifically identical, his statements may be accepted, until proved to be erroneous; but when he makes such sweeping statements as that respecting *Rhodaria robina*, it may safely be concluded that he will commit many errors through haste which he will afterwards regret: I will not then repeat this error by asserting that *R. robina* is not one or both of Guenée's species referred to *Endotricha*, since I have neither of that author's types before me, but I will positively maintain that it is neither generically nor specifically identical with any *Endotricha* known to me, nor with the *Pyralis stilbealis* and *P. docilisalis*, of Walker; I will further observe that I do not believe the last two to be varieties of the same species; although on this point I am open to conviction if Mr. Meyrick can show me a series of examples linking them together: on the other hand, Walker's species are referable to his genus *Doththa*, which appears to be congeneric with *Endotricha* (*E. flammealis*); and, therefore, on this head, as in *all but one* of my notes on synonymy, I am able to agree with Mr. Meyrick: whether he is right in stating that *Rhodaria*, Guen., is not separable from *Botys* will depend entirely upon what he regards as the type of the latter genus, a point which, at present, I have not the time to enter into.

I admit that I was over-hasty (in my paper in the *Annals*) in con-



# ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

(Continued from p. 14.)

All the remaining species in this Family have the eyes widely separated in both sexes, and are thus related to the smaller acalypte-rate *Muscidae*; their calyptra or alulets are always, however, more or less highly developed, so they must be retained among the *Anthomyiidæ*.

With the exception of those in the peculiar genus *Lispa*, Meigen included almost all the other species in the genus *Cænosiæ*; they differ, however, so much from each other in the size of the alulets, in the degree of pubescence of the arista, and in other characters, that it is necessary to divide them into a number of groups or genera, which I will briefly arrange or analyze in the following table:

- A. Alulets large, with unequal scales.
  - B. Palpi with dilated extremities ..... *LISPA*, Latr.
- BB. Palpi of the ordinary shape.
  - C. Arista plumose ..... *CARICEA*, Desv.
- CC. Arista pubescent or bare.
  - D. Abdomen of ♂ narrow, cylindrical, and with projecting appendages ..... *MACHORCHIS*, Rond.
  - DD. Abdomen of ♂ clubbed at the end, and without projecting appendages.
    - E. Internal transverse vein of wing opposite the end of the axillary vein.
      - F. Forehead and epistome prominent ... *MELANOCHELIA*, Rond.
      - FF. Forehead and epistome unprojecting... *CÆNOSIA*, Meig.
    - EE. Internal transverse vein opposite the end of first longitudinal vein ..... *ATHERIGONA*, Rond.
- AA. Alulets small, with equal sized scales.
  - G. Arista plumose, or sub-plumose.
    - H. Anal vein prolonged to the margin of wing... *MYCOPHAGA*, Rond.
    - III. Anal vein shortened ..... *CHELISIA*, Rond.
  - GG. Arista pubescent or bare..... *SCÆNOMYZA*, Hal.

## 23. *LISPA*, Latr.

*Gen. ch.*—Eyes bare, widely separated in both sexes; arista plumose; palpi with dilated extremities; alulets with the lower scale much longer than the upper one; anal vein elongated, but not reaching the margin of the wing.

## 1. TENTACULATA, Deg.

## 2. LITOREA, Fall.

Only two British species have been recorded of this singular genus, which may at once be distinguished from all the other Anthomyids by the singular spatulate enlargement of the ends of their palpi. Neither of them are common; *L. litorea* is a maritime insect.

## 24. CARICEA, Desv.

*Gen. ch.*—Eyes bare, widely separated by a space of nearly equal width in both sexes; arista with long hairs; alulets well developed; tibiæ all armed at their apices with four or five spines; anal vein rather short, only reaching about half-way from the base to the margin of the wing.

## 1. TIGRINA, Fab.

*leonina*, Rond.

## 2. CILIATO-COSTA, Zett.

*pantherina*?, Rond.

## C. TIGRINA, Fab.

This very common species has a long arista, which is only plumose along its basal half; the distal part being nearly bare. It has only three bristles seated on black spots, behind the transverse suture, in each of the two middle longitudinal rows of setæ on the thorax. The females closely resemble those of *Spilogaster communis*, but may be at once distinguished from them by the circlets of spines at the ends of the tibiæ.

## C. CILIATO-COSTA, Zett.

This differs from *C. tigrina* by having the two basal joints of the antennæ rufous; by the arista being plumose along almost its whole length; by having four instead of three bristles behind the suture in the middle dorsal thoracic rows of setæ; by the costal spine and ciliæ being much more developed; and by the transverse veins of the wings being more clouded. Rare. I only know the male.

## 25. MACHORCHIS, Rond.

*Cænosia*, Meig., Schin., &c.

*Gen. ch.*—Eyes bare, widely separated in both sexes; arista pubescent; abdomen of male narrow and sub-cylindrical, with prominent sub-anal appendages; alulets with unequal-sized scales; anal veins of wings not prolonged to the margin; legs elongated.

## 1. INTERMEDIA, Fall.

## 2. MEDITATA, Fall.

## 3. MEANS, Meig.

## M. INTERMEDIA, Fall.

This, the largest species (5 to 7 mm.), is of a dull ash-grey colour; the arista is sub-plumose; the thorax is marked with two brown lines; the abdomen is long, narrow, cylindrical, and immaculate; the legs are yellow, with the exception of the fore femora, the coxæ, and the tarsi, which are all grey; the hind femora are longer than the abdomen; the pulvilli are large and yellow. Not uncommon.

*M. MEDITATA*, Fall.

The arista has only short pubescence; the abdomen of the male is shorter and more conical than in *M. intermedia*; marked on the dorsum with four brown spots, and furnished on the under-side of the penultimate segment with a very large projecting process; the legs have the coxæ, femora, and tarsi, all black, and the knees and tibiæ yellow. Rare.

*M. MEANS*, Meig.

This species is very similar in form to *M. intermedia*, but is smaller (4 mm.); the arista is sub-plumose; the abdomen immaculate; alulets rather small, but with unequal scales; the legs are entirely black, with the exception of the knees and the proximal thirds of the fore femora, which are yellow. Not common.

(To be continued). *Y. P. 1884. June 18*

FURTHER INFORMATION AS TO THE MIGRATORY HABITS OF THE  
GALL-MAKING *APHIDES* OF THE ELM.

BY JULES LICHTENSTEIN.

My good and learned friend, Professor Horváth, Director of the *Phylloxera* station in Budapest, is an eminent Hemipterist, well known from his many good works on the *Hemiptera-Heteroptera*. He has now lately entered on the study of the *Homoptera* also, and has made such good progress that he became in a few years the first authority in his country for the knowledge of the *Phylloxera*, and was appointed director to the *Phylloxera* station of Hungary.

When I had the pleasure of seeing him here, I called his attention to my new ideas on the evolution of plant-lice from galls, and asked his good aid to support me against some of my adversaries in Paris, who consider, as a poetical fancy, my theories of migrations from plant to plant, or even from galls on trees, like elms or poplars, to grass roots.

Prof. Horváth is a sharp observer, and deserves more than any one the adjective of "*oculatissimus*," so often employed in entomology. Thus, I had the pleasure, soon after having charged him with that work of observation, to see in a French entomological paper (*Revue Française d'Entomologie*, April, 1883) a note from Horváth announcing that my theories were deserving of full confidence, for he had attentively observed the root-louse of the *Zea mäs* (*Penphigus zæ-müdis*, L. Dufour, after F. Löw), and had arrived at the conviction that it flew from the maize-roots to the trunks of the elm trees where it deposited the sexual forms.

Of course, I was highly pleased with this discovery, much more

so, indeed, than was M. le Professeur Balbiani, who had on former occasions declared such a migration quite opposed to entomological and botanical laws.

Moreover, as only one species of *Pemphigus* is known on the elm tree, viz.: the *Pemphigus pallidus*, Haliday (sub. *Eriosoma*), I fancied it was now a very easy job to gather galls of that insect when the emigration takes place, to put the emigrant winged-lice on roots of maize, and to notice how they thrive.

Under a bell glass I placed some good clean garden earth, in which I had planted some grains of Indian corn, and I thought, at the same time, I could try also to put besides the *Pemphigus* galls the other four galls of the elm tree.\* There is a sixth gall-louse on elm, the *Colopha compressa*, but it occurs only on *Ulmus effusa*, and never on *Ulmus campestris* in which the others are abundant. Well, to my great disappointment, not one of the young *Pemphigus* touched the maize-roots; they were all dead and dried up, in a few days. But, to my still greater astonishment, the young of *Tetraneura ulmi*, the most common of all the elm gall lice, fixed themselves immediately on the tender rootlets of the plant, and went on sucking and growing so satisfactorily, that, in ten days, they had acquired nearly double their previous size, and were covered with the usual white secretion, which we generally see on these insects.

Immediately the idea occurred to me that M. Horváth finding a root-louse on the Indian corn, had jumped to the conclusion that it could be no other than the *Pemphigus zæ-mädis*, and had never thought that it might be a *Tetraneura*.

Indeed, the difference between the two genera is a very trifling one: *Tetraneura* has but one cubital nervure in the under-wings, while *Pemphigus* has two, and no under-ground species of *Tetraneura* is known up to this time.

Hence, I wrote to Prof. Horváth:—"Please, dear friend, send me at once what you call *Pemphigus zæ-mädis*." By return of post I had the insect; I put it under the microscope, and saw at once it was a *Tetraneura*, and the very *Tetraneura ulmi* upon which Baron von Gleichen began his well-known observations, in Nüremberg, in 1770, and of which the full biology has also been discovered only in 1882, in Budapest; so now we know exactly:

1st.—That the "*Tetraneura ulmi*" comes out of eggs deposited in the crevices of the trunks of the elm tree, in the beginning of May, and forms a gall on the leaf. It is the *Pseudogyna fundatrix*.

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\* Viz.: *Schizoneura ulmi* and *lanuginosa*, *Tetraneura ulmi* and *rubra*.

cocoons were removed, from only just below the surface, for inspection after the insects were bred, I found each was of broad oval shape about 9 lines by 7 or 8, exteriorly composed of grains of earth very firmly united to a few fibres of grass-roots, of which plenty were in the turfy soil, and served to bind all together; on removing the earthy particles I reached the inner cocoon of opaque greenish-white soft silk, yet strong and elastic, in these qualities reminding me of that of *O. potatoria*, and in the softness of its closely-woven interior of that of *B. mori*; it was 7 lines long and 3 lines wide, rounded off anteriorly, widest in the middle, and tapered to a blunt point at the posterior end.

In each instance (except one) the pupa had evidently emerged from the cocoon and travelled away from it a little distance, as I found the pupa-skins thus lying on the bare earth, and only the old larval-skin lay shrivelled up at the bottom of the deserted cocoons; but the one from whence the *Anomalon* had come still contained the pupa-skin only minus a portion of the head and thorax, which lay in fragments, so that the cavity of the pupal body had been the puparium of the parasite.

The pupa of *globulariæ* is about 13mm. in length and of moderate substance throughout, with prominent thorax, the wing-covers short, but toward their ends projecting a little free from the body, the long antenna- and leg-cases are all free from the body, and seem to be suggestive of locomotion even before disclosure of the moth, the deeply divided abdominal rings have each on the back near their beginning a transverse ridge thickly set with hooks pointing backward, the tip of abdomen rounded off in a blunt point; the colour of the head, thorax, and wing-covers is dark olive-green and very glossy, the leg-cases and abdomen are of lighter shining green and the hooks black.

Emsworth : September 12th, 1883.

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*Myrmeleon Erberi*, Brauer, = *M. inconspicuus*, Rambur.—In the collection of Baron de Selys-Longchamps are a series of a *Myrmeleon* from Corfu (*Erber*) much like *M. formicarius*, L. (*formicalynx*, Burm.), but notably smaller; the species was described by Dr. Brauer (Verh. zool.-bot. Ges. Wien, 1867, p. 190) as *M. Erberi*. On comparing them with the types of *M. inconspicuus*, Rambur (Névroptères, p. 406), I find they are specifically identical therewith; hence Rambur's name should take priority. I possess a ♂ indicated "South of France," the same district whence Rambur believed his types were derived. These types consist of two perfect ♀ and one ♂ without head and abdomen; in the latter sex there is a conspicuous "pelote" at the base of the posterior wings. In describing the abdomen both Rambur and Brauer appear to have taken their description from the ♀, in which there are only



narrow yellow sutural rings. In the ♂ there is a large yellow anterior dorsal spot on nearly all the segments (often inconspicuous in dry examples unless brought out by the application of alcohol or benzine). In the Ann. Soc. Ent. Belg., xvi, p. 139 (1873), I stated, regarding *M. incertus*, Rambur, "probablement la femelle de l'espèce suivante" (*inconspicuus*), but Rambur distinctly states that his type of *incertus* is a ♂ without the "pelote" to the wings. I cannot now decide as to sex, for the type has lost its abdomen (there is no "pelote"), but, according to the colour of the head, I now believe *incertus* to be distinct from *inconspicuus*, and otherwise unknown to me. Hagen (Peters' Reise) thought an East African species might be identical with *inconspicuus*. Walker's *M. secretus* is closely allied to *inconspicuus*, but the head and thorax differ slightly, and the abdomen of the ♀ has the large spots which exist only in the ♂ of *inconspicuus*. Attention should also be directed to *M. irroratum*, Olivier (Encyc. Méthod.), but the description is probably too vague for identification.

In the Mediterranean district there exist quite a number of small species of *Myrmeleonidæ*, the synonymy of which remains in much confusion, and they are seldom captured in sufficient quantity, owing probably to nocturnal habits. It must have struck all entomologists who attend to these insects that the perfect insect is very seldom seen at large, although the larvæ are very abundant. In the course of my excursions I have never seen the common spotted species (*M. europæus*) at large, and the common plain-winged species (*M. formicarius*) only rarely, yet the larvæ of both abound in suitable localities.—R. McLACHLAN, Lewisham: 8th September, 1883.

*the generic, month. May, 1883. No. 233. 8th 1883. London*

## ANNOTATED LIST OF BRITISH ANTHOMYIDÆ.

BY R. H. MEADE.

(Concluded from p. 61).

### 26. MELANOCHELIA, Rond.

*Gen. ch.*—Eyes bare, widely separated in both sexes; arista bare; forehead and epistome prominent; alulets with the lower scale longer than the upper; internal transverse vein of wings opposite to the termination of the second branch of the first longitudinal; (auxiliary\*) anal vein shortened; abdomen of male slightly thickened at the apex, and with small sub-anal appendages.

#### M. RIPARIA, Fall.

The generic position of this species is very difficult to determine, and it has been placed in various genera by different authors. Meigen left it in his restricted genus *Anthomyia*, though on account of the wide separation of the eyes in both sexes, he ought to have removed it into that of *Canosia*, as he did with the closely-allied species, *A. litorea*, in which, however, the eyes of the male are more approximated. Rondani originally placed it in the genus whose name I have adopted,

\* In the analytical table published at page 59, it is printed *axillary* vein by mistake.



which he formed for its reception; but in his last volume\* he removed it into the genus *Limnophora* along with *A. litorea*. Haliday says† “This fly will form the type of a genus allied to *Limnophora* and *Lispa*,” but he did not make one. Schiner includes it in the genus *Myopina*, Desv., along with *M. reflexa* (*Musca myopina*, Fall.), but the latter species has very minute alulets, and properly belongs to the acalypterate division of the *Muscidæ*, in which it was placed by Meigen. This fly is not uncommon, and may often be found seated on stones in brooks and rivers. Haliday described and figured the larvæ and pupæ, which are aquatic and live among *Conserveæ*, to which they adhere by means of hooks with which they are furnished.

## 27. CÆNOSIA, Meig.

*Gen. ch.*—Eyes bare, widely separated in both sexes; arista pubescent or bare; forehead unprojecting; alulets with scales of unequal sizes; abdomen of male mostly sub-cylindrical, and thickened or clubbed at the end; anal vein of wings more or less abbreviated.

### Sect. 1—*Legs black.*

- |                          |  |                             |
|--------------------------|--|-----------------------------|
| 1. TRIANGULA, Fall.      |  | 2. SOLITARIA, Zett.         |
| <i>nigripes</i> ?, Macq. |  | <i>octosignata</i> ?, Rond. |
| 3. AGROMYZELLA, Rond.    |  |                             |

### Sect. 2—*Legs wholly or partly yellow.*

- |                       |  |                       |
|-----------------------|--|-----------------------|
| 4. INFANTULA, Rond.   |  | 8. SEX-NOTATA, Meig.  |
| 5. ELEGANTULA, Rond.  |  | 9. GENUALIS, Rond.    |
| 6. PALLICORNIS, Zett. |  | 10. GENICULATA, Fall. |
| 7. ANGULATA, Rond.    |  | 11. VERNA, Fab.       |
| 12. PEDELLA, Fall.    |  |                       |

### C. TRIANGULA, Fall.

This little species has been placed by Macquart in the genus *Limnophora*, and it possesses more of the characters of that genus than of those of *Cænosia*, with the exception of having the eyes widely separated in both sexes, for the abdomen is marked with a double row of large, triangular, or quadrate spots, whereas, in the spotted species of *Cænosia*, the spots are usually small and round or oblong. Not uncommon.

### C. SOLITARIA, Zett.

This possesses very similar characters to those of *C. triangula*, the abdomen being marked in a similar manner; it differs from it, however, in being rather larger, and in having the thorax entirely of a light ash-grey colour marked with three narrow indistinct brown stripes; while, in *C. triangula*, the thorax is dark brown or black with grey shoulders, and unstriped. Rare.

### C. AGROMYZELLA, Rond.

I have only seen one specimen of this species, which was in the collection of

\* Dipt. Italie prodromus, vol. vi. + Nat. Hist. Review, July, 1857, p. 195.

the late Mr. B. Cooke, of Southport ; it is characterized by the thorax and abdomen being both of an uniform black colour.

#### C. INFANTULA, Rond.

This pretty little species has the abdomen of the male laterally compressed, of a pale yellow colour, translucent at the base, grey at the extremity, and indistinctly marked on the second and third segments with two oblong brown spots.\* The palpi are yellow with brown tips ; the transverse veins of the wings are rather close together, the external one being rather nearer to the internal than to the termination of the fifth longitudinal vein ; the legs with coxæ are wholly pale, with the exception of the tarsi, which are more or less nigrescent. Rare. I possess a single male, which was captured by the late Mr. Francis Walker.

#### C. ELEGANTULA, Rond.

This closely resembles the last, but differs by being rather larger, by having the abdomen of the male wider and flatter, the palpi entirely pale, and the transverse veins of the wings rather further apart. This species is very similar to *C. mollicula*, Fall., but may be distinguished by having the scales of the alulets larger and unequal in size, and by the abdomen of the male being without the large sub-anal appendages which are so characteristic of the latter species. Rare. I captured one male in July, 1883, near Bicester, in Oxfordshire.

#### C. PALLICORNIS, Zett.

This is a well-marked species, which has yellow antennæ, pale whitish palpi ; the abdomen with the first two segments pale and translucent and the legs yellow. The late Mr. B. Cooke, of Southport, sent me a specimen of this fly for examination in 1875.

#### C. ANGULATA, Rond.

This, like all the three preceding species, has the abdomen partly pale, the first two segments being yellow and translucent ; the thorax is ash-coloured and unstriped ; the abdomen has the third and fourth segments grey, and is marked down the dorsum by a longitudinal sub-interrupted black stripe, and by two lateral round spots on each segment, which are very indistinct on the basal pale coloured portion. The hinder edges of all the segments are also marked by a narrow white line. The legs have all the femora grey, and all the tibiæ and tarsi yellow, with the exception of the terminal joints of the latter, which are black. The wings have both the transverse veins clouded with black. This pretty and peculiarly marked species appears to be rare. I possess a single male, which I obtained from the late Mr. F. Walker.

#### C. SEXNOTATA, Meig.

This may be considered the typical, as it is also the most common species in the genus. The thorax and abdomen are both grey ; the former is marked with three stripes, and the latter with six spots of a brown colour ; the legs are yellow, with the exception of the tarsi, which are nigrescent, and the fore femora, which are often brown or grey, especially in the females.

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\* These are omitted by Rondani in his description.

## C. GENUALIS, Rond.

This rare species closely resembles the preceding one, from which it only differs in some minute points, one of which is that the posterior femora are blackened at their apices, somewhat in the same manner as those of *C. geniculata*, Fall., of which it is, perhaps, only a variety. The only specimen which I have seen belonged to the late Mr. B. Cooke. I have included three other species in my list, viz., *C. geniculata*, Fall., *C. verna*, Fab., and *C. pedella*, Fall., upon the authority of Walker, who records them as British in the "Insecta Britannica;" I have not, however, yet seen an indigineous specimen of either species.

## 28. ATHERIGONA, Rond.

*Gen. ch.*—Eyes bare, remote in both sexes; forehead prominent; antennæ with the third joint prolonged, the arista bare, somewhat geniculated, and having the second segment a little elongated; palpi short, with dilated extremities; scales of alulets large, and unequal in size; abdomen of male short, subcylindrical, and clubbed at the end; wings with the internal transverse veins, placed near their bases, and opposite to, or in front of, the end of the first branch of the first longitudinal vein; anal vein prolonged, but not reaching the margin of the wing.

## A. VARIA, Meig.

The peculiar little fly included in this genus bears some resemblance to a *Tachinid*, by the form of the head and the size of the antennæ and alulets; it is also like a *Lispa*, by the shape of the palpi; it has a yellow abdomen marked by four or six black spots. The description of *Anthomyia varia* by Walker does not apply to this species, though he makes it synonymous with the *A. varia* of Meigen. Rare.

## 29. MYCOPHAGA, Rond.

*Cænosia*, Meig., Schin.

*Gen. ch.*—Eyes bare, remote in both sexes, but much more so in the females than in the males; arista plumose; abdomen oblong and subcylindrical in the male, ovoid and depressed in the female; alulets with small and equal-sized scales; wings with the anal veins prolonged to the margin.

## M. FUNGORUM, Deg.

This fly might be placed among the species of *Hylemyia*, if the eyes of the male were not separated by a widish space. It is the largest species in the *Cænosia* group, being often four lines or more (8 or 9 mm.) in length. The arista is furnished with long hairs; the thorax is grey with yellow shoulders; the abdomen and legs are yellow, except the tarsi, which are black. Not very common.

## 30. CHELISIA, Rond.

*Hoplogaster*, pt. Rond.*Cenosia*, Meig., Macq., Schin.

*Gen. ch.*—Eyes bare, remote in both sexes; arista subplumose; abdomen of males narrow, elongated, and subeylindrical, with large, projecting, sub-anal processes; alulets very small, with equal-sized scales; wings with the anal veins abbreviated.

1. MONILIS, Meig.

*umbripennis*, Zett.

2. MOLLICULA, Fall.

*nemoralis*, Meig.

## C. MONILIS, Meig.

This little fly is of a brownish-grey colour, with brown wings and legs; the thorax is marked down the dorsum with a central black stripe; the abdomen of the male has also an interrupted dorsal stripe in the middle, and a number of small spots or punctures of a black colour on the sides; the sub-anal processes are furnished with two blunt projecting lobes. Rare.

## C. MOLLICULA, Fall.

This species resembles *C. monilis* in general form and structure, but is very different to it in colour; having the antennæ (except at the base), abdomen, and legs all of a pale yellow colour, with the exception of the hinder portion of the abdomen in the male, which is sometimes nigrescent, and is marked with two or four black spots. The thorax is grey, and indistinctly striped; the sub-anal male appendages are very large, and furnished with a long apical style, flexed forwards under the belly; and also with two long processes or lobes, projecting backwards. Not rare.

## 31. SCHÆNOMYZA, Hal.

*Ochtiphila*, Fall., Meig.*Sciomyza*, pt. Meig.

*Gen. ch.*—Eyes bare, remote in both sexes; antennæ sub-erect, approximate at their bases, and divergent at their extremities, having the third joints dilated; arista bare, abdomen neither thickened, nor dilated at its extremity; scales of alulets very small and equal; wings with the internal transverse veins placed beyond the termination of the second branch of the first longitudinal veins; anal veins very short.

1. LITORELLA, Fall.

2. FASCIATA, Meig.

I have included these two little flies in my list of British *Anthomyiidae*, on the authority of the late Mr. Haliday, who found them both on the sea coast at Holywood, in Ireland.\*

I shall conclude the List of British *Anthomyiidae* with an analytical arrangement of those genera which have the eyes *always more or less approximated in the males*. I have already attempted to tabulate those in which the eyes are remote in both sexes.

\* Entomol. Mag., vol. i, p. 167 (1833).

# GENERUM ANTHOMYIDARUM DISPOSITIO.

## *Divisio prima, oculis in mare contiguis.*

- A. Alulæ mediocres squamis inæqualibus.  
 B. Femora antica maris subtus dentata .....7. HYDROTEA, Desv.  
 BB. Femora antica maris simplices.  
 C. Proboscis apice acuminata et geniculata .....8. DRYMEA, Meig.  
 CC. Proboscis apice mollis et plerumque dilatata.  
 D. Oculi hirti.  
 E. Arista plumata.  
 F. Abdomen subrotundum, carinæ faciales ciliatæ .....1. POLIETES, Rond.  
 FF. Abdomen ovale vel oblongum, carinæ faciales nudiæ.....2. HYETODESIA, Rond.  
 EE. Arista pubescens vel subnuda .....11. TRICHOPTHICUS, Rond.  
 DD. Oculi nudi.  
 G. Abdomen maculis discretis signatum.  
 II. Arista plumata vel subplumata .....4. SPILOGASTER, Macq.  
 III. Arista pubescens vel nuda .....5. LIMNOPHORA, Desv.  
 GG. Abdomen sine maculis discretis.  
 I. Arista plumata.  
 K. Alarum vena analis longa, sed marginem non attingens...  
 3. MYDEA, Desv.  
 KK. Vena analis margini posteriori saltem apice spurio producta...  
 6. HYDROPHORIA, Desv.  
 II. Arista pubescens vel nuda.  
 L. Tibiæ posticæ maris incurvæ .....10. OPHYRA, Desv.  
 LL. Tibiæ posticæ maris rectæ vel subrectæ.  
 M. Epistomii margines barbati .....9. POGONOMYIA, Rond.  
 MM. Facies imberbis.  
 N. Vena auxiliaris spinosa .....21. ACANTHIPTERA, Rond.  
 NN. Vena auxiliaris inermis .....18. ANTHOMYIA, Meig.  
 KKK. Alarum vena analis satis brevis, venaque axillaris contra apicem ejusdem incurvata.  
 O. Arista plumata .....13. PIEZURA, Rond.  
 OO. Arista pubescens vel nuda.  
 P. Abdomen ovoidum et depressum..... 12. HOMALOMYIA, B.  
 PP. Abdomen spatulatum, basi subangustatum...  
 15. CÆLOMYIA, Hal.  
 PPP. Abdomen angustum, subcylindricum, et maculatum...  
 14. AZELIA, Desv.  
 AA. Alulæ parvæ, squamis æqualibus.  
 Q. Arista plumata .....16. HYLEMYIA, Desv.  
 QQ. Arista pubescens vel nuda.  
 R. Oculi hirti .....17. LASIOPS, Meig.  
 RR. Oculi nudi.  
 S. Pedes nigri.  
 T. Abdomen maris subcylindricum...  
 19. CHORTOPHILA, Macq.  
 TT. Abdomen maris, angustum, vel oblongum et depressum .....20. PHORBIA, Desv.  
 SS. Pedes toti vel partim flavi.....22. PEGOMYIA, Desv.

Bradford, Yorkshire:

September, 1883.

NOTES ON THE MIGRATION OF *APHIDES*.

BY G. B. BUCKTON, F.R.S.

The friendly criticism on my fourth volume of British *Aphides*, by M. Lichtenstein, in the last number of the Ent. Mo. Mag. (p. 79), necessitates a few remarks from me in reply, and I may be permitted here to make them.

The subject of migration of *Aphides* is of considerable interest from a scientific, as well as from an economic point of view, and the production of well ascertained facts will at once assert their value, and eventually hold its own against all comers.

First, I will freely admit, and express regret for, a carelessness of memory, in apparently committing M. Lichtenstein to the position, that some oak-inhabiting *Aphides* descend to grass-roots in the autumn. I would gladly make the emendation he suggests, and alter the word oak-*Aphides* into elm-*Aphides*.

Again, from the context of my remarks, it may be supposed that I class *Achillea* and *Solidago* amongst annual plants. Their root-stocks are as clearly perennial in Britain as they are in France. This point does not, however, affect the main question as to what is the destination of the ova of their infesting *Aphides*. The destruction or drying up of the stems and leaves of these plants would seem to preclude their localization of winter-laid eggs in such parts. Prof. Balbiani has done well in making known the true place of oviposition of *Siphonophora millefolii*.

As far back as last November, M. Lichtenstein informed me that he had discovered the "pupiferous form" of *Tetraneura rubra* feeding underground on the roots of *Triticum caninum*, and he said that at the same time other specimens of the species were concealing themselves within the crevices of the elm-bark. He then stated, as he does also now, "that there is no doubt of it being the same insect which wanders from the elm to the grass-roots, and from the grass-roots to the elm."

It would now appear from Prof. Horváth's corroborative experiments at Buda-Pesth, that two European species of *Tetraneura* have underground habits.

In his observations, M. Lichtenstein more than once uses terms which would seem to admit that this question is yet *sub judice*. He several times describes as "my views," "my theories of migration" from plant to plant.

In unexpected phenomena it is clearly permissible to hold one's



R. H. Meade.

1887.

Supplem.<sup>t</sup> to annotat.<sup>d</sup> list of  
British Anthomyidae.



SUPPLEMENT TO ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

*in letter to Mr. J. G. Rehn, 1887.*

Since the last portion of my List was published in October, 1883, I have found a few British species of *Anthomyiidae* which appear to be new, and a considerable number of others which were unknown to me at the time of the compilation of my paper. I purpose, therefore, to go through the different genera into which the Family has been divided; shortly to describe those species which seem to be new; to record all additional ones which have come under my notice; to amend several errors into which I had fallen; and, finally, to add a few supplementary remarks, which may be of interest.

POLIETES, Rond.

The few species included in this genus resemble some of the true *Muscidae*, by having their bodies softer and less spinose than those of most of the other larger *Anthomyiidae*; Rob. Desvoidy, therefore, placed them in his genus *Macrosoma*, between the genera *Graphomyia* and *Mesembrina*, but, as he afterwards acknowledged, this was a mistake, for the widely open extremity of the first posterior cell of the wing is an essential character of all Anthomids.

P. HIRTICURRA, sp. n.

*Mas, cæruleo-nigra nitida, parce tenuiterque setosa. Thorax vittis albidis striatus. Abdomen glauco-cinereum, linea dorsali nigra, tessellisque nigris signatum. Oculi longe-hirti. Calyptra squamis aureis. Halteres obscuri. Alæ hyalinæ, nervis transversis obliquis, sed rectis. Tibiæ posticæ arcuatæ, denseque villosæ.* Long., 9 mm.

*Male*, shining steel-blue; antennæ, palpi and legs black.

*Head*: eyes sub-contiguous, thickly clothed with long yellowish hairs; face with glistening white reflections; cheeks small and reddish-brown; mentum grey, thickly clothed with black hairs and bristles; vibrissæ extending about half way up the facial groove; antennæ rather short, third joint scarcely twice as long as the second; arista long, thickened at the base, thinly clothed with hairs of a moderate length to a little beyond the middle, extremity long and bare.

*Thorax* with *scutellum* shining blue-black; the former is marked with five silver-grey longitudinal stripes, which are very distinct at the sides and front margin, but become pale behind; they divide the dorsum into four blue-black bands, the outer pair of which are twice as wide as the inner pair; the dorsal bristles are small and weak, but the sides are furnished with numerous hairs and setæ.

*Abdomen* bluish-grey, showing white and black reflections; it is marked down the back with a longitudinal central black stripe, which is dilated into a large trian-

gular spot on the posterior margin of the second segment, and into a similar smaller one on the edge of the third; there are very few bristles, except upon the sides and apex.

*Wings* hyaline, yellow at the root; there is no costal spine; the internal transverse veins are placed opposite the termination of the auxillary veins; the external transverse veins are nearly straight, but placed obliquely.

*Calyptra* have yellow scales with bright orange margins.

*Halteres* small, with dull yellow stalks and grey heads.

*Legs* rather long; middle tibiæ with a series of bristles of moderate and equal length along the whole of their external and posterior surfaces, and also with a number of long spines at their extremities; hind femora clothed with long soft hairs; hind tibiæ distinctly curved towards their extremities, furnished with long hairs on the whole length of both their outer and inner sides, and with a series of spines on their posterior surfaces.

This species seems to be rare. I have only seen a single male, which I captured in August, 1883, in the Woods near Bolton Abbey, in Craven, Yorkshire. It bears a considerable resemblance to *P. albo-lineata*, but differs from it by being larger, by having four instead of two wide stripes upon the thorax, by the hind tibiæ being curved and very hairy, as well as by other characters.

## HYETODESIA, Mde.

### H. TRIGONALIS, Meig.

This species, which is abundant in the Lake District about Windermere, as well as in the South of England, was recorded in my list under the name of *H. lata*, for which I mistook it. Mr. Verrall pointed out the error to me, and has recorded the name of the fly in his "Hundred New British Species of *Diptera*;" he includes it, however, in the genus *Spilogaster*, but the eyes are distinctly hairy (the cause of my mistake), therefore, it must be correctly placed among the *Hyetodesiæ*. It resembles *H. lata*, and also *Spilogaster fuscata*, by having a series of triangular black marks down the back of the abdomen. It differs from *H. lata* (which has not yet been recorded as British) by having, like *H. serva*, only three posterior dorsal bristles on the thorax in the two parallel rows of setæ which are placed in the space between the middle and lateral stripes, while there are four in *H. lata*; the eyes of the male are also closer together (being contiguous) in *H. trigonalis* than in *H. lata*, in which they are only approximate; the scutellum has two lateral black marks in the former, while there is only one basal mark in the latter; the tibiæ also are much lighter in colour in *H. trigonalis* than in *H. lata*. It may be at once distinguished from *S. fuscata* by the eyes being hairy.

### H. BASALIS, Zett.

In the female of this species the eyes are almost bare, therefore, unless examined under a strong lens, it may easily be mistaken for the female of *Mydæa urbana*, which differs from the male in having the fore femora yellow like the posterior ones; the former species may, however, be easily distinguished from the latter by the form of the epistome, which is much more prominent in *H. basalis* than in *M. urbana*.

## H. SIMPLEX, Wied.

When I published my list I had only seen a single female of this rare species, which I captured near Edinburgh in August, 1875; in August last (1886), however, I found several males near Ulverston, Lancashire. It is a pretty, well-marked species. The hairs upon the eyes, as well as those of the arista, are short; there are only three posterior thoracic dorsal bristles, as in *H. serva* and *H. trigonalis*, and the first and second rings of the abdomen are red and translucent. Meigen described the male and female under different names, the former being his *A. posticata*, and the latter the *A. simplex* of Wiedemann. In his 7th and Supplementary Volume he places the latter in his genus *Aricia*, as having hairy eyes, whilst he puts the former among his *Hylemyia*, which have naked eyes. Both sexes are well described by Zetterstedt.

## SPILOGASTER, Macq.

## S. TETRASTIGMA, Meig.

This rare species was recorded as British and briefly described by Walker in the *Insecta Britannica*, but I never saw a specimen until August last (1886), when I captured several males as well as females near Ulverston, Lancashire; the latter sex was previously unknown.

The male and also the female have the thorax marked with four longitudinal black stripes, the outer ones being broad, irregular in shape, and interrupted at the suture. There are only three dorsal bristles, behind the suture, between the middle and lateral stripes; the abdomen in the male is marked by four and sometimes by six dorsal spots, which are, in some specimens, rather indistinct; the female has the abdomen immaculate, and of an uniform pale grey colour; the antennæ are entirely black in the male, but have a more or less rufous tinge on the two first joints in the female; the palpi are black, with yellow roots, in both sexes; in the male the legs have the coxæ, tarsi, bases, and proximal two-thirds of the upper surfaces of the fore femora, as well as the bases of the posterior femora, black, and the rest of the legs yellow; in the female the coxæ, all the femora (except sometimes the bases of the fore pair), with the tibiæ are yellow, and only the tarsi are black; the latter sex has also the posterior margin of the scutellum flavescent.

The female, which has evidently been overlooked, owing to the absence of the abdominal spots, bears a very close general resemblance to both those of *Mydæa impuncta* and *M. separata*; it may be known at once from the former by the colour of the palpi, which are entirely yellow in *M. impuncta*; from *M. separata* it may be distinguished by the arista being much longer haired, and by its having only three dorsal thoracic bristles behind the suture, while *M. separata* has four, as is also the case with *M. impuncta*.

## S. PERTUSA, Meig.

This species has been recorded as British by Mr. Verrall, in his "Hundred New British Species of *Diptera*." I have not been so fortunate as to meet with an English specimen myself.

## S. FLAGRIPES, Rond.

By mistake the name of this species was written *flagipes* in my list.

## LIMNOPHORA, Desv.

### L. ALBIFRONS, Rond., *non* Zett.

This species differs from all the other true *Limnophoræ* with which I am acquainted by having yellow tibiæ. Rondani knew only the male, I have had the pleasure of finding the female, which agrees very closely with Rondani's description, but differs in a few points, which I will now give. In the male only the four posterior tibiæ are yellow, the front ones being black with yellow bases. In the female all the tibiæ are entirely of a clear yellow colour. In the male Rondani says that the thorax is grey and immaculate (*unicoloria*); in the female it is grey, very pale in front and on the sides, and marked on the dorsum with several short black stripes or marks. The abdomen of the female, like the male, has each segment marked by two large spots, which in my specimen are subquadrate in form.

The head in the female has the eyes separated by a space which occupies about one-third of the width of the head, it is deep black, quite straight on the sides, and has a spot on the forehead with a stripe on each side white, like the face.

Rondani does not give the size of the male; my female specimen measures about 4 mm. in length.

I captured a single female of this well-marked and interesting species at Conishead Priory, near Ulverston, Lancashire, on August 2nd, 1886.

### L. SOLITARIA, Zett.

This species was placed in my list in the genus *Cænosiæ*, but upon close examination I find that it possesses the true characters of a *Limnophora*; thus, the eyes of the male, though rather widely separated, are still nearer together than in the true *Cænosiæ*, the space between them not measuring more than a fourth or a fifth of the width of the head, while in the *Cænosiæ* it will measure at least a third; besides this, there is another and more important character of distinction, for the inner sides of the eyes in the males are convex in this species, as in other *Limnophoræ*, being nearer together in the centre than they are above and below; while in the *Cænosiæ* they are straight, leaving the intraocular space of an even width throughout in the males, as is the case in most female *Anthomyiæ*.

## HYDROTÆA, Desv.

### H. SIMILIS, *sp. n.*

*Mas, niger nitidus; thorax in fronte breviter albo striatus; abdomen albidum-pallinosum, parce fusco-tessellatum, linea longitudinali tenui nigra; oculi nudi subcontigui; alæ basibus marginibusque anticis fuscæ, venis longitudinalibus 3<sup>tiis</sup> et 4<sup>tis</sup> inflexis; femora antica subtus bituberculata; tibiæ anticæ imbarbata; tibiæ posticæ callo tomentoso apicali destitutæ.*

*Long., 9 mm.*

This species bears such a close resemblance to the common and well-known one, *H. dentipes*, that I shall very briefly describe it, chiefly dwelling upon those points in which it differs from that species.



The colour is somewhat of a blue-black, while *H. dentipes* has a brown tinge; the fly is also rather larger than that species, and the eyes of the male are rather nearer together, being sub-contiguous. The thorax is more distinctly striped. The abdomen, when viewed horizontally from behind, is entirely of a glistening white colour, but shows a few dark tessellations when looked at from above or in front. There is a longitudinal dorsal stripe, which is narrow and quite straight, and not interrupted or dilated in the middle or at the edges of the segments, as is usually the case with the stripe in *H. dentipes*. The legs are long, the hind femora reaching to the end of the abdomen. The fore femora have one rather short, stout, but sharp pointed tubercle or tooth beneath their anterior extremities towards the outer side, and a blunt tubercle placed a little further back on the inner side of it. In *H. dentipes*, though the species is called unidentate, there are really two teeth lying close together and parallel with each other. The fore tibiae are thicker and less indented than those in *H. dentipes*, and destitute of the little tuft of hair on their ends, which are so characteristic of that species. The middle femora have a much smaller and thinner tuft of hairs at their bases on the under and anterior surfaces than those which are found in *H. dentipes*. The middle tibiae are armed much in the same way as I have described those of *H. dentipes* to be in my list. The hind tibiae have no tubercle or callosity at their inner extremity, and also differ from those of *H. dentipes* by having a group of strong bristles in the middle of their anterior or under surfaces.

The wings are brown or nigrescent at their bases, and along their front halves; the third and fourth longitudinal veins are rather more convergent than in *H. dentipes*, the fourth especially being more bent. The external transverse veins are rather more oblique and sinuous than those of *H. dentipes* usually are. The calyptres have the scales rather larger than those in *H. dentipes*, the under one projecting further beyond the upper one; they are also surrounded by a darker yellow rim. The *Halteres* have light stalks and brown heads. The female is unknown to me.

I found two males of this fly at Douglas, I. M., in June, 1885, in a plantation at the back of the Castle Mona Hotel, along with numerous specimens of *H. dentipes*.

## II. IMPEXA, Loew.\*

I found a single male of this pretty species at Windermere in June, 1884, and have met with it since near Bradford; I have also received specimens from other parts of England, and at the beginning of August, 1886, captured several of both sexes near Ulverston, Lancashire.

It is a well-marked species, about 6 mm. in length, of a shining black colour, with the thorax unstriped, but the abdomen with grey reflexions and a narrow dorsal stripe. The eyes are bare, and contiguous in the male, the third and fourth longitudinal veins of the wings are straight and nearly parallel. There is a peculiar grey patch of very minute microscopic hairs running across the wing just in front of the external transverse vein, and extending to the posterior border, this is absent in the female. Another characteristic feature in this species, is the presence in the male of a group of strong blunt black spines on the under surfaces, of the middle femora, near their bases.

The females are rather smaller than the males, but like them shining black.

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\* Beschreibungen Europ. Dipt., iii, Band, Halle, 1873.

## HOMALOMYIA, Bouché.

## H. FUSCULA, Fall.

This species is undoubtedly synonymous with Meigen's *H. floricola*. Fallén's description of the male of *H. fuscula* agrees with Meigen's description of the same sex of *H. floricola*, but not with Meigen's account of *H. fuscula*. The latter author seems to have applied Fallén's name to an entirely different species, for he says in his description of *H. fuscula* that the abdomen of the male is short, whereas it ought to be oblong (länglich), as he correctly states it to be in his description of *H. floricola*. He also says that it shews brown reflexions, which are not present in the latter species. Lastly he states that in the female of *H. fuscula* (that of *H. floricola* was unknown to him) there is a wide frontal stripe, whereas it is a characteristic feature of this species that the space between the eyes in the female is unusually narrow; not much more than double the width of that in the male.

Fallén's name being the oldest must supersede that given by Meigen, and the synonymy of the species will therefore stand thus—

H. FUSCULA, Fall. et Zett.

*floricola*, Meig. et Schiner.

*cilicrura*, Rond.

## H. SPISSATA, Meade.

My friend Mr. Verrall has pointed out to me that this species was described by Loew under the name of *H. coracina*,\* before the part of my annotated list appeared, in which I recorded it as a new species, I therefore hasten to make the correction.

The name of *spissata* must therefore sink into a synonym, thus—

H. CORACINA, Lw.

*spissata*, Mde.

## H. ROSERII, Rond.

Mr. Verrall has recorded the capture of this pretty little species in England,† and kindly gave me two specimens. The male has the thorax of a shining metallic brownish-black colour, with white sides and shoulders. The scutellum is brown with a reddish margin. The abdomen is of a clear transparent whitish yellow colour at the base, and black at the apex. The legs, with the exception of the tarsi, are bright yellow.

## H. TRIANGULIFERA, Rond.

On carefully examining the small specimens of *Homalomyia*, which I had placed together under the name of *H. serena*, I found that they consisted of two distinct species, nearly allied, but presenting several decided points of difference. One of these I now propose to place under Rondani's name of *triangulifera*, as his description agrees with it more closely than that of any other species that I can find, with the exception perhaps of *H. lugubrina*, of Zetterstedt; and also because the name is very appropriate; one of the most distinguishing characters being the presence of three very well defined triangular spots on the dorsum of the abdomen.

The male is of a shining black colour on the thorax, the shoulders and sides

\* Berliner Ent. Zeit., xviii, 47.

† List of a hundred new British species of *Diptera*, Ent. Mo. Mag., vol. xxii.

being marked with white; the eyes are sub-contiguous; the abdomen is of a glaucous-white colour, with black triangular marks. The middle femora are armed beneath with long and strong spines, which are grouped together, somewhat into the form of a tuft, towards the centre. The middle tibiæ are ciliated along the whole length of their under surfaces with stiff hairs, which gradually increase in length towards the extremity. The hind tibiæ have only a few irregular bristles on their outer sides, and no long hairs on their outer ones. The wings are fuscous. The female is like the male in colour, the thorax being black, and strongly marked on the sides with white; the abdomen is brown, shining, and immaculate. The length is about  $3\frac{1}{2}$  mm.

This species is not uncommon. It is rather larger than *H. serena*, has a more glaucous abdomen, with more distinct triangular marks; it is of a blacker colour, the legs being quite black; the middle legs are more strongly armed with spines and hairs; the transverse veins of the wings are rather farther apart, and the axillary vein is longer and more curved, curling round the extremity of the anal vein.

#### *H. NIGRISQUAMA, sp. n.*

*Mas, thorace ex toto nigro-nitido; abdomine cinereo micante, linea dorsali nigra, fasciisque transversis nigrescentibus obscuris; oculis nudis maximis, contiguis; alis brevibus fuscis; calypttris atris; halteribus flavescentibus; pedibus simplicibus nigris.*  
*Long., 4 mm.*

*Head* rather wider than the thorax, the sides being entirely covered by the eyes, which are large, bare, and contiguous.

*Thorax* shining black, without any signs of white on the shoulders or sides.

*Abdomen* rather wide, conical and flattened, without projecting anal appendages; it shows grey and black reflections, when viewed from behind, and has a longitudinal black dorsal line, which is interrupted at the sutures, but not dilated into definite triangular spots, as in many species in this genus; when viewed in certain lights, however, brown or black ill-defined patches shew themselves across the middle of the segments.

*Wings* short and sub-nigrescent.

*Calyptra* have the scales of moderate and unequal sizes, and of a brownish-black colour.

*Halteres* bright yellow.

*Legs* quite black, and simple, showing no special armament or structure, with the exception of there being two little tufts of short bristles which project one on each side from the under surface of the ends of the middle femora.

I have only seen two examples of this well-marked little species; one was captured on July 7th, 1882, near Bicester Oxon, and the other at Conishead Priory, near Ulverston, on August 2nd, 1886. I do not know the female.

## HYLEMYIA, R. Desv.

## H. COARCTATA, Fall.

The larvæ of this species have been found in the stalks of wheat, upon which they feed, often doing great damage to the crops. In May, 1882, I bred several of these flies from young wheat plants (infested by little maggots) which were sent to me by Mr. Creese, of Teddington, near Tewkesbury, at the request of Miss Ormerod.

## CHORTOPHILA, Macq.

## C. SYLVESTRIS, Fall.

This large species has been recorded as British by Mr. Verrall, in his "Hundred new British species of *Diptera*." It is a mountain species which he captured in Scotland, closely resembling *Hydrophoria conica* in shape, size, colour, and markings; it may, however, easily be distinguished from it by the scales of the alulets being much smaller and equal in size, by the arista being pubescent instead of plumose, and by the eyes being approximate in both sexes, instead of being contiguous in the males and widely separated in the females, as in *H. conica*. As I before mentioned in my list, Schiner placed this species, together with *C. Billbergi*, in the genus *Eriphia*, Mgn.

## C. TRAPEZINA, Zett.

Mr. Verrall, in his "Hundred new species," has recorded the capture of *A. (Phorbia) striolata*, Fall., and remarks that it is the same as the fly that I had named *C. trapezina*, Zett. It is exceedingly difficult to determine the identity of many species that have been only shortly and insufficiently described, and I allow that my specimens do not correspond exactly with some that I have received from the continent under the name of *C. trapezina*, the central marks on the back of the abdomen being larger and more quadrate in the continental specimens than in the English ones, where they are triangular in form; still I cannot make them agree with the descriptions given of *P. striolata*, Fall., of which Zetterstedt says, "*Valde similis A. radicum*,"\* in which the abdomen is marked by strong transverse black lines in addition to the longitudinal dorsal stripe.

## C. CINEREA, Fall.

In my notes on this fly I find that I have mixed up the male and female of two distinct species. The one that I took for the male of *C. cinerea* being really that of *P. cepetorum*. I discovered my error by breeding a number of both males and females of the latter species from onions, when I found that the male flies were identical with those that I had named *C. cinerea*, while the females were quite distinct. In colour, markings, &c., the two species are very similar, but the females of *C. cinerea* are larger than those of *P. cepetorum*, and differ as well by the following points of structure. The arista in *C. cinerea* is distinctly pubescent

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\* Zett., Dipt. Scand., tom. xiv, fol. 6242.

throughout its entire length, while in *P. cepetorum* it is only slightly hairy for a short distance beyond the thickened base. The fronto-orbital bristles\* are differently arranged in the two species. In *C. cinerea* the upper series (three in number) is placed on an outer line to the lower series, and turns outwards; the bristles in the lower series are also much smaller than the upper ones, are five or six in number, and turn inwards. In *P. cepetorum* the bristles in the upper and lower series form one extended, though curved, line; they turn, however, in opposite directions as in the other species, but there is less difference in size between the bristles in the two series, and those in the lower one are only three (sometimes four) in number. The edges of the second and third abdominal segments have larger and longer bristles in *C. cinerea* than in *P. cepetorum*; the wings also differ in the two species—in *C. cinerea* the third and fourth longitudinal veins are slightly divergent at their extremities, while in *P. cepetorum* they are quite parallel, and the third reaches the border exactly at the apex of the wing, while in *C. cinerea* it ends a little before the apex.

The males belonging to *C. cinerea* are still unknown to me.

#### C. LONGULA, Fall.

Zett., Schin., Rnd., *non* Meig., *nec* Macq.

This is a well-marked little species, of which I have only seen a single male, which was given to me by Mr. Brunetti, and captured by him at Balham in August, 1885. It has a narrow cylindrico-conical abdomen, marked on the dorsum with a longitudinal row of narrow triangular spots. The thorax has two dark longitudinal lines on the dorso-central region placed rather widely apart, which are formed by a series of brown spots surrounding the roots of the outer row of the dorso-central bristles. The characteristic peculiarity of this species, however, is the clouding of the transverse veins of the wings, by which it somewhat resembles *Hylemyia pullula*, Zett., and with which it was confounded by Meigen and Macquart. The face and forehead are not very prominent in this species, so it will come under my second section. Rondani has remarked this, but Schiner has fallen into the error of placing it next to *C. buccata*.

#### PHORBIA, R. Desv.

P. DISCRETA, Meig.

Mr. Verrall has recorded the capture of this species, of which he kindly sent me specimens. It is well marked, characterized by the eyes of the male being rather widely separated (sub-contiguous), by the thorax being striped with five rather indistinct lines, by the abdomen being flat, having brown reflexions, being marked by an interrupted longitudinal dorsal band, and black transverse lines, and by the wings being brunescent.

#### P. VETULA, Zett.

Mr. Verrall has also recorded the capture of this species, but, as he remarks, there is some doubt respecting it. I think it is probably an undescribed species.

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\* See Osten-Sacken's "Essay of Comparative Chetofaxy."



## P. IGNOTA, Rond.

Both males and females were bred by Mr. Inchbald in June, 1885, from the flower heads of ragwort.

## PEGOMYIA, R. Desv.

P. SILACEA, Meig., Schin.,  
(olim *P. diaphana*, Auct.).

Mr. Verrall has recorded the capture of this rather rare species in Britain, and since my last list was published I have found it myself near Bradford, as well as in Oxfordshire, and have also received a specimen from Miss Prescott Decie, found near Tenbury. This species has been mixed up by authors with the *Musca flaveola* of Fallén, which it somewhat resembles. I placed the latter in the first part of my list in the genus *Mydæa*, but there have been great differences of opinion as to its proper position; Schiner arranges it among his *Linnophora*, under the specific name of *diaphana*, and as the eyes in some specimens are slightly hairy, it has also been classed among the *Ariciæ*. Under these circumstances I think it will be better to place it, together with its congener (*P. silacea*), in the genus *Pegomyia*. Both species have moderate and unequal sized scales to the alulets, and will therefore come into my first division of that genus. Fallén and Zetterstedt place them next each other, and the descriptions of these species have been so mixed up, that the synonymy has become very confused.

I had a most interesting correspondence at the beginning of last year with Professor Mik, of Vienna, respecting these two species, and from the information which I thus obtained, as well as from the interchange of specimens, I hope I may be able to clear up the subject. In the first place the name *diaphana* has generally been supposed to have been applied by Wiedemann to the less highly developed species which we now propose to call *silacea*; but, on Prof. Mik examining the types (of which he found three) in the Wied. Collection in Vienna, he found that they all (though named *diaphana*) belonged to the more highly developed species, the *M. flaveola* of Fallén. This being the case, Prof. Mik suggested to me that the name *diaphana* had better be dropped, for it is really only applicable to *M. flaveola*, which has a translucent abdomen, while the other has not, and it would lead to much confusion to transpose the names entirely. Meigen having described the less highly developed of these species in his 7th volume, under the name of *A. silacea*, and Schiner having followed him, Prof. Mik thought that we had better adopt this title; he promised to publish some observations himself upon the subject, but as he has not yet done so, I have pleasure in following his suggestion.

Before endeavouring to clear up the synonymy, I think it will be better briefly to point out the principal points of distinction between the two species, as neither of them have been fully described.

P. FLAVEOLA.—Frontal triangle in male mostly black, but occasionally red (young spec. ?); eyes contiguous, and sometimes slightly pubescent; frontal space in female occupying about one-third of the width of the head, and also mostly black; face glistening white in both sexes; antennæ with two basal joints yellow, and third joint black in both sexes; arista shortly ciliated, in some specimens



nearly bare; thorax testaceous and glabrous, showing the spur of a white central stripe on its front margin, and having four bristles behind the suture in the outer dorso-central row; abdomen oval, yellow, and translucent, sometimes a little infuscated on the back of the fourth and fifth segments, otherwise immaculate, edges of the second and third segments destitute of bristles on the dorsum; legs yellow, with the exception of the tarsi, all the joints of which are black; hind tibiae of the males with a strong black spur or spine projecting from their inner ends; wings with the external transverse veins rather oblique, and sometimes a little sinuous; the internal transverse vein is placed a little before the termination of the axillary vein.

*P. SILACEA*.—Frontal triangle in the male, as well as frontal space in the female, yellow; eyes contiguous in the male, and quite bare; face yellowish-white; antennae entirely yellow in the male, but with third joint black in the female; arista shortly ciliated, length of hairs about the same as in the former species; thorax of a dead whitish-yellow colour, which is lighter at the fore part; unstriped; bristles in the dorso-central rows small, only three in the outer row behind the suture; abdomen small and flat, dull yellow, and when viewed in certain lights showing a wide dorsal interrupted stripe\* as well as transverse dark lines; all the segments are furnished with a thick even row of black bristles on their posterior edges; legs yellow, with the exception of the last four joints of the tarsi; metatarsi pale; there is no spine on the inner extremity of the hind tibiae in the male; wings, with the external transverse veins very oblique in the male, so that they lie almost parallel with the posterior borders of the wings, they are also very sinuous, being bent like the letter S; in the female these veins are much less oblique and sinuous than in the male; internal transverse veins placed exactly opposite the termination of the axillary vein.

A comparison of the two descriptions will show that the species are widely different, and that one is more highly developed than the other. Only knowing the former when I published my list, I placed it in the genus *Mydæa* on account of the shape of the abdomen and size of the alulae, &c. Prof. Mik thinks that it should be classed among the *Aricia* (*Hyetodesia*, Meade), on account of the slight hairiness of the eyes, and he called my attention to the fact that H. Loew has described this fly as a new species by the name of *Aricia aculeata*,† giving this specific name from its having the spurs on the hind tibiae. The almost nude state of the arista scarcely fits this species to hold such a position, and in the present unsettled, and I may say unsatisfactory, state of the generic distribution of the *Anthomyiidae*,‡ I think it will be better to place both species provisionally in the genus *Pegomyia*, which is already a very artificial group, including some species that are much more highly developed than others, but have the abdomen and legs yellow.

I will conclude these remarks with giving a sketch of what I believe to be the correct synonymy of these species.

\* Meigen mentions this in his description of *A. silacea*, but it is omitted by Schiner; who says, however, that the abdomen shrinks up in drying and becomes short; this probably caused him to overlook the stripe.

† Berl. Entom. Zeitschr., 1873, pp. 33–52. *Diptera nova* a F. Kowarzio capta.

‡ M. J. Schnabl, of Warsaw, has lately published an elaborate memoir upon the genus *Aricia*, the scope of which he proposes greatly to enlarge. He considers the presence of hairs upon the eyes an insufficient generic distinction.

## PEGOMYIA FLAVEOLA.

Syn. *Musca flaveola*, Fall.  
*Anthomyza flaveola*, Zett.  
*Anthomyza varians*, Zett.  
*Anthomyia diaphana*, Wdm. et Meig.  
*Pegomyia diaphana*, Macq.  
*Limnophora diaphana*, Schin.  
*Aricia aculeata*, Lw.  
*Mydæa flaveola* et *variens*, Meade.

## PEGOMYIA SILACEA.

Syn. *Anthomyia silacea*, Meig. et Schin.  
*Anthomyia diaphana*, Rond.  
*Musca diaphana*?, Fall.  
*Anthomyza diaphana*, Zett.

P. FULGENS, Meig.,  
 Macq., Rond., Wlk.?, non Schin.  
*A. limbatella*, Zett.

This appears to be a rare species. I have only seen one specimen, which I captured some years ago upon Shirley Heath. It is characterized by having the palpi yellow with black tips, as in *P. nigratarsis*, Zett., which species it a good deal resembles, but from which it differs by having the shoulders and scutellum yellow, and the abdominal segments of the female marked by transverse black lines.

## P. HYOSCYAMI, Panz.

I bred two females of this species from larvæ which had mined, or rather blotched, the leaves of garden beet in August, 1886. This shows that phytophagous insects do not always confine themselves very closely to plants of the same family.

## PEGOMYIA, R. Desv.

## P. EPHIPIUM, Zett., Schin.

In July last (1887), after the last part of this Supplement had been sent to press, I found three males of this species (which has not yet been recorded as British) at Baslow, near Chatsworth in Derbyshire. It bears a close resemblance to both *P. fulgens* and *P. vittigera*, but is decidedly distinct from either. The scales of the alulets are rather small, but unequal in size; therefore it must be placed in my first division of the second section of this genus.

The palpi are entirely yellow. The thorax is reddish-brown on the dorsum, covered with grey tomentum, and having the shoulders and sides, as well as the front edge, yellowish-white. The scutellum is yellow. The halteres and alulets are pale yellow. The abdomen is oblong, narrow and flat, brownish-yellow (testaceous) in colour, somewhat paler and translucent at the base, and becoming nigrescent towards the end. It is hairy, and furnished beneath the apex with large, black, globular genital appendages. The legs have the tarsi black, and there is also a black patch (Wisch) on the upper surfaces of the ends of the femora; all the rest of the limbs is pale yellow. This species differs from *P. fulgens* by having the alulets rather smaller, the palpi wholly yellow (without black tips), and the femora blackened on their upper extremities. It may be known from *P. vittigera* by its having the whole dorsum of the thorax grey, instead of its being only marked by a longitudinal grey stripe; and by the femora being blackened upon their upper ends, not surrounded near their apices with a black ring as in *P. vittigera*.

I do not know the female.

## CARICEA, R. Desv.

*C. EXSUL*, Zett., and Schin.\*

Both males and females of this fine species were sent to me last year by Miss R. Prescott Decie, of Bockleton Court, Tenbury. She had captured them in Devonshire. The antennæ and palpi are black. The arista is sub-plumose. The frontal space is much narrower in the male than the female, being about one-fourth of the width of the head in the former and more than a third in the latter sex. The face is rather prominent, and of a silvery-white colour, which extends up the sides of the frontal space, the middle of which is occupied by a bluish-grey stripe. The thorax and abdomen are clear ash-grey; the former is marked by two narrow longitudinal stripes placed near together, and has the shoulders and sides white. The abdomen is oblong and sub-cylindrical in the male, ovate and pointed in the female; it is marked on the back by four reddish-brown spots; the apex in the male is but little thickened, and the genitalia small. The legs are black, with the exception of the four posterior tibiæ in the male, which are testaceous, as well as the front knees and the points of the other femora. In the female the fore tibiæ are also brown. The tibiæ are surrounded at their extremities by a group of strong spines as in *C. tigrina*. The alulets are large and milk-white. The wings have the external transverse veins [74] oblique, and, as well as the internal ones, slightly clouded. The third and fourth longitudinal veins are parallel and curved backwards. Sept., 1887.

This fly seems very rare.

*C. HUMILIS*, Meig., Rond.

This pretty little species, which is about 3 mm. in length, has the male abdomen cylindrical, clubbed at the apex, and marked by six brown spots, as well as by a central row of small oblong marks. The antennæ and palpi are black; the arista is long and sub-plumose (Meigen says that it is bare, but the hairs are pale, very fine, and difficult to see); the legs are black, with the exception of the tibiæ and metatarsi, which are testaceous. The female closely resembles the male, except by the shape of the abdomen.

I found several specimens of this small fly at Buckingham in August, 1884.

*C. SEXMACULATA*, Meig.

This is also a well-marked little species, rather smaller than the last, which it closely resembles, the abdomen being marked in a similar manner; it differs from it, however, by having the legs wholly black, with the exception of the bases of the fore tibiæ, which are testaceous. The venation of the wings is also slightly different in the two species. Rondani has pointed out that in *C. humilis* the distance between the two transverse veins is equal to that of the external one from the point of the fifth longitudinal vein, and we find that in *C. sexmaculata* the external transverse vein is nearer to the end of the fifth longitudinal than to the internal transverse vein.

I found a single male in my garden near Bradford, on April 24th, 1886.

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\* Schiner spells the name of this species *exul*, but I think that Zetterstedt is correct.

## MACHORCHIS, Rond.

## M. MEDITATA, Fall.

I captured a female of this rare species in my garden in July, 1886; previously I only knew the male. It closely resembles the female of *C. tigrina* in shape, size and markings, but differs by having a pubescent instead of a plumose arista, and by the abdomen being without the longitudinal central marks on the dorsum between the lateral spots, which are generally seen in *C. tigrina*.

## CÆNOSIA, Meig.

## C. SCRUPULOSA, Zett.

*pacifica*?, Meig.

This species, of which the female only has been described, differs from *C. triangula*, Fall., by having the thorax marked only by one central longitudinal brown stripe instead of by three broad confluent ones, and by having the eyes placed nearer together. I captured two females at Buckingham, in August, 1884.

## C. PICTIPENNIS, Lw., et Schin.

SAPROMYZA *costata*?, Meig.ORCHISIA *costata*, Rond.

[75] Mr. Dale sent me two specimens of this curious little species (the generic position  
Sept., 1887. of which is rather obscure) captured (I believe) in Dorsetshire. It is characterized by the upper halves of the wings, with the exception of the tips, being nigrescent; the colour is very dark throughout the whole of the sub-marginal cells, and gradually becomes paler as it extends downwards, terminating in the lower edge of each discoidal cell. The lower portion of the wing and the tip are quite clear. The thorax is ash-grey; the abdomen of a yellowish or brownish-grey colour, sometimes marked with an indistinct dorsal stripe, and with two small round spots on each of the last two segments in the male, and upon all the segments in the female. The antennæ have the two basal joints yellow, and the third one black, with a sub-plumose arista.

## C. GENICULATA, Fall.

I admitted this species into my list in 1883, though I had not then seen a British example. I captured one, however, in my garden near Bradford in June, 1886. It may be known from *C. sexnotata*, Meig., by the points of the hind femora being black.

## CHIOSIA, Rond.

*Gen. ch.*—Eyes bare, remote in both sexes; arista pubescent; abdomen of male narrow and elongated with small sub-anal appendages; alulets with small equal-sized scales; wings having anal veins extended to the margin.

## C. ALBITARSIS, Zett., Rond.

This pretty and peculiar little species, which Mr. Verrall has recorded as a native of Scotland, has the thorax brown with grey shoulders; the abdomen dark brownish-grey, hairy, and marked with an indistinct, longitudinal, black interrupted

stripe. The wings are slightly brunescent; the legs in the male have the front tarsi longer than the tibiae, and the three proximal joints more or less marked with white.

This genus was formed by Rondani for the reception of the above-mentioned species, and as this had not been recorded as an inhabitant of Great Britain at the time my "Annotated List of British *Anthomyiidae*" was drawn up, I did not include it. In my analytical table of the genera with widely separated eyes in both sexes, which was published in the Ent. Mo. Mag., vol. xx, p. 50, the genus *CHIROSLA* should have had its place between *MYCOPHAGA* and *CHELISIA*.

## CHELISIA, Rond.

### C. TRICOLOR, Zett.

This small and rare species bears a close general resemblance to *C. mollicula*, Fall., so I have placed it in the same genus; it must, however, be looked upon as an aberrant species, for the male is destitute of the large and complicated genital processes seen in *C. mollicula*, which form one of the characteristic features of the genus.

*C. tricolor* has very short (almost rudimentary) anal veins, so I cannot put it into the last genus (*Chirosia*), though it would agree with its other characters. The antennae are wholly black; the arista is pubescent; the thorax is grey, marked with two indistinct stripes; the abdomen has the first and second segments yellow, and the third and fourth grey, each segment being marked with two black spots. The division between the yellow and grey segments is sharply defined, by which it differs from *C. mollicula*, in which the hind segments, when nigrescent, are only partially [76] and irregularly so. Sept., 1887.

I found a single male at Buckingham in August, 1884, and a single female (which is a good deal larger than the male) at Conishead Priory, near Ulverston, Lancashire, in August, 1886.

## SCHÆNOMYZA, Hal.

### S. LITORELLA, Fall.

Mr. W. H. Harris, of Cardiff, sent me a specimen of this little maritime fly in 1886, which he had found there. It may at once be known by its generic character of having the first longitudinal veins shortened, so that the internal transverse veins are placed considerably beyond the termination of the axillary branches of the first longitudinal vein in the costa. The alulets are so small, that this species might more properly be left among the *Acalypteratae*, where Meigen placed it in the genus *Sciomyza*.

Bradford: 1887.





R. H. Meade.

1889.

2<sup>d</sup> Supplement.

Antomyiidae.



SECOND SUPPLEMENT TO ANNOTATED LIST OF BRITISH  
*ANTHOMYIIDÆ*.

BY R. H. MEADE.

This Family of *Diptera* contains so many species, and so many that are closely allied to each other, that I shall offer no apology for publishing some further remarks upon it. Since the date of my last supplement\* several additional British species have been found, some of which seem new to science, while others are new to Great Britain; all of these I shall be glad to record, describing those that are new, and shortly pointing out those characters belonging to others by which they may be distinguished from their congeners, or which seem to be of interest.

The *Anthomyiidae* have lately received a good deal of attention from continental Dipterists, especially from Dr. John Schnabl, of Warsaw, who has published several very valuable papers upon them.† He kindly sent me several rare and doubtful species, which will enable me to clear up some difficult and disputed points of synonymy.

Dr. Schnabl commenced his first paper by some remarks or criticisms upon the generic groups into which this Family has been subdivided, stating that he considered the genera *Hyetodesia*, *Mydæa*, *Spilogaster*, *Limnophora*, and *Trichophticus* to be separated from each other by insufficient and very artificial characters; he would, therefore, retain them in a single genus, for which he would keep R. Desvoidy's old name of *Aricia*.

This would be really a retrograde movement, as Prof. Mik has pointed out;‡ for as it is necessary, for the sake of convenience, to cut up large groups of species into smaller ones, it is better to give these groups names than to sub-divide the *Anthomyiidae* in the way Zetterstedt and Walker have done, and as Meigen did at first.

It is impossible to make any generic groups altogether natural, for Nature knows nothing of genera, being only cognizant of species or individuals; all that we can do is to arrange those species together which resemble each other by the greatest number of characters; and, after all, every genus will contain some aberrant species which might almost be as well placed in another genus.

The genus among those mentioned which is most anomalous and difficult to define, or separate from *Hyetodesia*, is *Trichophticus* of

\* January, 1887.

† "Contributions à la Faune Diptérologique," par J. Schnabl. St. Petersburg: 1887, 1888, 1889.

‡ Entomologische Nachrichten, 1887, Heft. xv.

Rondani. If I were about to revise the generic arrangement of the *Anthomyiidae*, I should be tempted to expunge this genus and insert a new one in its place, next to *Hyetodesia* (*Aricia*\*), and include in it all those species with hairy eyes and toothless femora, which have a pubescent instead of a plumose arista, only moderate though unequal sized alulets, and an oblong or conical instead of an oval abdomen.

I shall arrange the observations which I have to make concerning different species under the respective genera to which they belong.

### HYETODESIA, Mde.

#### H. VAGANS, Fln.

I inserted this fly in my list upon the authority of Walker, though I doubted whether it was a distinct species, as all the specimens I had seen so named were identical with *H. basalis*, Zett.; through the kindness of Dr. Schnabl, however, I have now obtained both male and female specimens of what seem to me to be the true *M. vagans* of Fallén, and they are quite distinct from *H. basalis*, Zett.

Fallén describes the two points which are characteristic of this species, when he says that the eyes are only pubescent and separated a little from each other in the male. His words are "oculi vix hirsutuli in mare approximati non coherentes." Zetterstedt points out the same peculiarities, but they have been overlooked by Meigen, Macquart, Schiner, and Walker. In distinction from this, *H. basalis* has the eyes of the male furnished with long hairs, and quite contiguous. There are also several other characters by which these two species may be known from each other, viz., *H. vagans* is rather larger than *H. basalis*; the colour is more ash-grey in the former, while it is yellow-grey in the latter; the face is rather more prominent and the cheeks deeper in *H. vagans* than in *H. basalis*; the palpi are much thicker in *H. vagans* than in *H. basalis*; the fore femora are more or less blackened in *H. vagans*, while they are usually quite pale in *H. basalis*; and lastly, the middle stripes upon the thorax are placed nearer together in the former than in the latter species. The female of *H. vagans* resembles the male in all the principal characters, the eyes are about as hairy as those of the male, while in *H. basalis*, though the males have the eyes long haired, those of the females are almost naked.

This species seems to be very rare, except in the north of Europe; I have not seen a British specimen.

#### H. VARIEGATA, Mgn.

I formerly looked upon this species as only a variety of *H. scutellaris*, Fln., but upon the examination of a specimen kindly sent to me by Dr. Schnabl, I find that there are several decided points of distinction between them. The male has the head wider and the eyes a little wider apart in *H. variegata* than in *H. scutellaris*; the antennæ are rather shorter in the former than in the latter and entirely black or grey, while the basal joints are usually rufous in *H. scutellaris*; in *H. variegata* the shoulders of the male are usually concolorous with the rest of the thorax, while they are more or less rufous or fulvous in *H. scutellaris*; in *H. variegata* the scu-

\* If the above scheme was carried out, I should be inclined to re-introduce the name of *Aricia* instead of *Hyetodesia*, as I think it was changed by Rondani upon insufficient grounds.

tellum is nigrescent at the base, while in *H. scutellaris* it is wholly pale, as in *M. pagana*. The abdomen in *H. variegata* has always a decided black longitudinal stripe on the dorsum, which becomes widened posteriorly, giving it a strong resemblance to the abdomen of *Musca corvina*; in *H. scutellaris*, on the contrary, the dorsal stripe is either wanting or only short and narrow; the abdomen also has the edges of the segments often marked with transverse black lines, which are not found in *H. variegata*. The females of the two species are more difficult to distinguish from each other, as the shoulders of those of *H. variegata* are often rufous like those of *H. scutellaris*.

This species seems to be rare upon the continent; I have not seen a British example.

## II. LUGUBRIS, Mgn.

Several distinct though very closely allied species have been mixed up under this name. Zetterstedt separated two from *H. lugubris*, which he named *H. morio* and *H. consobrina*, but his diagnostic points of distinction are not very clear, especially those separating *H. morio* from *H. lugubris*, which, from his description, would only appear to be varieties of the same species, as he seems to have suspected himself, for he says, "forte tamen specie diversæ." There is no doubt, however, that there are several quite distinct species allied to *H. lugubris*.

Some years ago I received a specimen of *Hyetodesia* from Herr Kowarz, captured at Asch, in Bohemia, which he labelled *H. lugubris*; this was the only fly bearing this name which I had then seen, and the remarks made in my list respecting this species (in the description of *H. dubia*) were taken from it. Having lately obtained other specimens named *H. lugubris* from Dr. Schnabl, of Warsaw, and Herr Kuntze, of Dresden, I find that they are quite distinct from Herr Kowarz's example, and upon sending the latter to Dr. Schnabl, he tells me that it is a new and undescribed species.

This group of species has been very carefully studied by Dr. Schnabl, and the several distinct ones which he has defined are most elaborately described. He makes *H. morio*, Zett., to be quite distinct from *H. lugubris*, Mgn., the eyes of the male being subcoherent in the former, while they are contiguous in the latter; the arista in *H. morio* is also shorter haired, and the epistome less prominent than in *H. lugubris*; besides which, the number of post-sutural central dorso-thoracic bristles is not the same, there being four in *H. morio* and only three in *H. lugubris*. Dr. Schnabl has also fully described *H. consobrina*, Zett., which he says has a still shorter epistome and shorter haired arista than *H. morio*. I do not know whether he has seen Zetterstedt's types, or named these decidedly distinct species after him upon his own authority. Dr. Schnabl has also described another and new species belonging to this group, which he has named *H. hybrida*.

To show the difficulty of defining the characters of the true *H. lugubris* of Meigen, I may mention that the specimens sent to me from Warsaw and Dresden, though exactly similar in most points, such as having the projecting snoutlike epistome, long haired arista, contiguous male eyes, black indistinctly striped thorax, &c., which are characteristic of the species, had a different number of post-sutural thoracic bristles, those from Warsaw having only three, while those from Dresden had four.

When I published my Annotated List and First Supplement, I had not seen a British specimen of *H. lugubris* or of any of its congeners, though it had been recorded as indigenous by Stephens and Walker. A few months since, however, I had the pleasure of receiving one from Miss R. Prescott-Decie, of Bockleton Court, near Tenbury, which she had captured at Chagford, South Devon, in May, 1888. I determined this to be *H. consobrina*, Zett.

### H. SUDETICA, Schn.

At Baslow, in Derbyshire, in July, 1887, I captured two males of a distinct and well marked little species which appeared to me to be new to science. In colour, form and general appearance it bore a strong resemblance to *H. basalis*, Zett., but was only half the size; and also differed by having only a pubescent arista and short haired eyes. I was in doubt whether to place it in the genus *Hyetodesia* or *Trichophticus*, especially as it had a strong spur at the inner end of each hind tibia, as is found in several species of the latter genus; but the oval shape of the abdomen with its general form and colour pointed to its proper place being in the more highly developed genus. I intended to publish a description of it, but delayed doing so until I found that it had also been discovered at about the same time (in July and August, 1887) by my friend Dr. Schnabl at Gräfenberg, in Austrian Silesia, and a description of it published in the *Entomologische Nachrichten*\* under the name of *Alloeostylus sudeticus*. He placed it in a new genus, in which he also included *H. simplex*, Wdm., and *M. flareola*, Fln., but I think it better to leave it for the present in the genus *Hyetodesia*.

This little fly is about 5 mm. ( $2\frac{1}{2}$  lines) in length, of a yellowish-grey colour, with the thorax marked with four longitudinal black stripes, the outer ones being maculiform, and furnished with four post-sutural dorso-central bristles. The abdomen has a fine dorso-central stripe, and shows some dark reflections; the legs are testaceous with black tarsi, and in my specimens the fore femora only have the greater part nigrescent; while Schnabl says that in his, "femoribus obscure piceis," which I suppose applies to them all. The hind tibiæ, as I have mentioned, are armed at their inner extremities with a blunt spine or spur, which consists of two bristles joined together into a fasciculus. I have not seen a female, but Dr. Schnabl captured two which seem closely to resemble the males.

(To be continued).

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\* 1888, No. 4, Seite 19-50.



SECOND SUPPLEMENT TO ANNOTATED LIST OF BRITISH  
ANTHOMYIIDÆ.

BY R. H. MEADE.

(Continued from p. 396).

H. DUBIA, Mde.

Since I described this species as new in the first part of my list, I have found that it has been previously discovered by Professor Mik, of Vienna, and named *H. Goberti*; my name must, therefore, sink into a synonym.

MYDÆA, R. Desv.

M. ALLOTALLA, Meig.

Some years ago Mr. Verrall sent me two specimens of this rare fly, captured at Lee, Kent, which were the only ones I had seen, until Dr. Schnabl gave me another lately of the same species, which he designated *S. bisignata*, Zett. Mr. Verrall's specimens, as well as Dr. Schnabl's, have the abdomen marked with two small, indistinct, triangular spots placed near each other on the second segment, and with two other very faint ones on the third segment, while Meigen says that his *M. allotalla* was unspotted. As my specimens agree very closely with Zetterstedt's description of *S. bisignata*,\* I am inclined to think, with Dr. Schnabl, that they are the same, but as *M. impuncta* often has the abdomen spotted, when it becomes the *S. demigrans*, Zett.; so I think it highly probable that the former species may likewise often have the abdomen immaeulate, when it will agree with Meigen's description of *M. allotalla*, showing that *M. allotalla*, Meig., and *S. bisignata*, Zett., are only varieties of the same species.

M. NIGRICOLA, Fall.

This species is rare. I had only seen one British specimen when I published my list, whose habitat was unknown to me; in July 1887 however, I captured a well-marked example at Baslow, Derbyshire. This little fly closely resembles *M. vespertina*, Fall., in form and colour, but differs by having yellow legs, the fore femora and tarsi only being black.

M. SEPARATA, Meig.

A few months ago Miss R. Prescott-Decie sent me a Dipteron which seemed to differ from the ordinary specimens of *M. separata*, and I named it *M. grandæva*, Zett. Dr. Schnabl, of Warsaw, also lately forwarded to me both males and females of a fly which he also so labelled. All these specimens closely resembled those of *M. separata*, only differing by having the fore femora more or less blackened at the base. Zetterstedt, in his description of the female of *M. grandæva* (he did not know the male), says the forehead is rather prominent, the basal halves of the fore femora are black, the external transverse veins of the wings are straight, the arista pubescent, &c.

The specimens which I had received as *M. grandæva* agreed with those which I possess of *M. separata* in all points except in the colour of the fore femora, and on looking over my examples of the latter species (of which I have a good many

\* The abdomen being spotted, it becomes a *Spilogaster*.

specimens) I find several which have the bases of these parts more or less blackened ; so I have arrived at the conclusion that *M. separata*, Meig., and *M. grandæva*, Zett., are the same.\*

## SPILOGASTER, Macq.

### S. QUADRIMACULATA, Fall.

In my list I followed the example of Rondani, and named this species *quatuor-maculata* ; it is more correctly designated *quadrимaculata* by Fallén.

### S. ATRIPES, *sp. n.*

As I stated in the first part of my list, the *S. duplicata*, Meig., must be looked upon as the representative of a group of several closely allied species, or perhaps only varieties ; which are very difficult to define or discriminate from each other. In June last I captured at Hornsea, near Hull, two males of a species which though nearly allied to the one which I have described as the true *S. duplicata* of Meigen,† is decidedly different, and is also distinct from *S. duplaris*, Zett., as well as from *S. communis*, Desv. From its black legs I shall call it *S. atripes*.

♂. *Nigro-cinerea, oculis subcontiguus ; arista longe-plumata, thorace antice albo-cinereo quadristriato setis dorso-centralibus tribus pone-suturam ; abdomine quadrimaculato, segmentis subanalibus prominentibus ; pedibus prorsus nigris.*

*Long., 7 ad 8 mm.*

*Head* : eyes subcontiguous ; arista long haired. *Thorax* clear ashy-grey, with front margin almost white ; marked with four very distinct shining black stripes, the middle pair straight, extending from the front edge to a little behind the transverse suture, the lateral ones maculiform, shortened in front and extending backwards nearly to the scutellum ; dorso-central bristles five in number, two before and three behind the suture. *Scutellum* clear grey and immaculate.

*Abdomen* cylindrico-conical, with four small black spots, two on the second and two on the third segment ; subanal segments large, and furnished with a prominent process, which projects forwards and ends in a hairy tuft near the middle of the venter. *Legs* quite black, armed as in *S. duplicata*.

*Wings* clear, transverse veins unclouded, external one oblique and slightly sinuous, costal spine large. *Alulets* white. *Halteres* yellow.

This species differs from all the others in the group by having only three dorso-central thoracic bristles behind the transverse suture ; *S. duplicata*, *S. duplaris*, and *S. communis* having four ; the form and size of the subanal male processes are also different, they being larger and more prominent in *S. atripes* than in either of the other three species, which all have them very similarly developed ; lastly, this species has the legs quite black, whereas, in each of the others, the knees, and often the hind tibiæ, are somewhat rufous, even in the males.

I could not find a female.

### S. FRATERCULA, Zett.

This species is nearly allied to *S. pertusa*, Meig., in size, colour, &c., but differs by having the arista less pubescent (it is nearly bare towards the apex), and the legs darker in colour. In *S. pertusa* the fore femora and tarsi only are black, and the hinder femora and all the tibiæ are flavescent ; while in *S. fratercula*, besides the

\* *M. separata* of Schiner is a distinct species, which has the arista plumose.

† The *Mydina nigripes* of R. Desvoidy is considered to be synonymous with *S. duplicata*, Meig.

fore femora, the basal halves of the four hinder ones are black as well as the tarsi; while the extremities of the posterior femora and the tibiæ are rufous or testaceous instead of yellow.

I found a single male of this species at Baslow, in Derbyshire, in July, 1887.

*S. SPINIFEMORATA, sp. n.*

♂. *Nigro-cinerea, fronte non-prominenti; oculis subcontiguïs; arista subplumata; antennis palpisque nigris; thorace lineis quatuor nigris striato; pedibus nigris, geniculis tibiisque ruficentibus; femoribus spinolosis; tibiis posticis pilosis.*

*Long., 6 mm.*

*Head:* forehead and epistome unprojecting; eyes subcontiguous; frontal space black; antennæ and palpi black; the former with the style subplumose, the hairs being longer on the upper than the under-side. *Thorax* covered with grey tomentum, having four longitudinal black stripes, the outer ones straight (like the middle pair) in front, but merging behind into irregular oblong black patches; sides marked with sinuous whitish lines, which extend to the bases of the wings; medio-central dorsal bristles four in number, behind the suture. *Scutellum* grey.

*Abdomen* cinereous, hairy, conico-cylindrical, with six triangular black spots, two very small upon the first segment, and two larger ones on the second and third segments; anal segments with two moderate sized bilobed, flattened, subanal processes.

*Wings* tinged with yellowish-brown at the base and along the upper half; veins all stained with brown; both transverse veins clouded; third and fourth longitudinal veins diverging somewhat from each other towards the apex, which lies almost in the centre between their extremities; transverse veins rather near together; external one straight, but rather oblique. *Calyptra* yellowish-brown, fringed with a yellow margin. *Halteres* pale yellow.

*Legs*, with coxæ and tarsi, black; fore femora black, except at the apex, which is red; middle and hind femora with their basal two-thirds black, and the ends, together with the tibiæ, rufous; fore tibiæ piecous. All the femora are furnished beneath with a row of long and strong spines, which are arranged in two rows under the hind ones. The fore tibiæ have a single spine before the apex; the middle tibiæ have two bristles on the outer side a little beyond the middle; the hind tibiæ are very hairy, having a number of long and strong hairs of nearly equal lengths along the whole outer surface, as well as numerous soft and shorter ones on their inner sides.

I received a single male of this well-marked species from Miss Preseott-Decie, which she captured at Bontddu, North Wales, August 21st, 1888. It bears considerable resemblance to *S. fratercula*, Zett., but differs essentially by having spinose femora and hairy hind tibiæ.

*S. ANCEPS, Zett.*

Dr. Schnabl lately sent me some specimens similar to those of *S. communis*, Desv., labelled *S. anceps*, Zett., and told me that, in his opinion, *S. anceps*, Zett., *S. communis*, Desv., and *S. casia*, Macq., were the same. Zetterstedt's description of *S. anceps* will apply very well to the females of *S. communis*, but the males of the latter species are generally much more nigrescent than he represents those of *S. anceps* to be, so, in my opinion, the name *anceps* should be rather considered synonymous with *S. quadrum*, F., than with *S. communis*, Desv.

(To be continued).



# SECOND SUPPLEMENT TO ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(Concluded from p. 426).

## HYDROTÆA, R. Desv.

H. PARVA, sp. n.

♂. *Nigra nitida, abdomine pallide-casio tomentoso, linea nigra dorsali signato. Oculi magni nudi arcuè contigui; alæ sub-brunescens venis transversis appropinquis, apiceque venæ longitudinalis quartæ leviter recurvo; halteres nigri. Femora antica unidentata; tibiisque anticis excavatis.* Long., 3 mm.

*Head*: forehead flat, epistome slightly prominent; eyes large and bare, closely and deeply contiguous; antennæ short and grey, surmounted by a snowy-white triangular spot; arista almost bare; palpi black. *Thorax* shining black, with hoary spots on the shoulders, and four medio-central dorsal bristles behind the suture. *Scutellum* bright black.

*Abdomen* oval, and tapering towards the apex, which is pointed, with small subanal processes; colour, light bluish-grey with the first segment black, second, third and fourth segments marked on the dorsum with a longitudinal black stripe, which, tolerably wide at first, narrows towards the apex.

*Wings* pale brown, transverse veins rather near together, the internal one being placed over the discoidal cell nearly two-thirds from its base; fourth longitudinal vein curved upwards a little at its extremity. *Calyptra* sub-fuscons. *Halteres* nigrescent.

*Legs* black, fore femora with one short sharp tooth on the under-side near the end, and also with a blunt hairy tubercle placed a little behind and on the inner side of the tooth; fore tibiæ deeply indented at the base, and a little thickened along their front half. Middle femora with two long blunt spines beneath their base; middle tibiæ with two bristles on the inner sides near the middle; hind femora a little curved, having a row of hairs of nearly equal lengths along their outer sides as well as on the basal halves of their inner surfaces, which are then bare to near the end, where three or four bristles are placed; hind tibiæ with a few long bristles on their outer and anterior surfaces, and with a number of short adpressed hairs on their inner extremities.

I found a single male of this little fly, which is peculiar by being much smaller than any other that I know in this genus, in an osier bed near Buckingham in August, 1887. It seems closely allied to the *Musca glabricula* of Fallén, and may possibly be identical with it; but his description is very short, and neither he, Meigen, nor Zetterstedt mention the colour of the abdomen, but indicate that the whole insect is black, so I have decided to describe it as a new species, and give a somewhat full diagnosis.

The *H. floralis* of R. Desvoidy is given as a synonym of *H. glabricula*, but he only described the female, and I have not seen that sex of *H. parva*.

## TRICHOPTHICUS, Rond.

T. HIRSUTULUS, Zett.

In my last Supplement I omitted to record the occurrence of this species in





Britain. Mr. Verrall found it plentifully in Arran in June, 1882, and kindly sent me several specimens; I also captured three males myself at Baslow, in Derbyshire, in July, 1887.

It is oblongo-cylindrical in shape, shining black, with a grey abdomen having an interrupted longitudinal stripe. The eyes are rather long haired; the arista is decidedly pubescent, almost sub-plumose; the wings are mostly nigrescent, and the halteres are also described as being of the same colour, but in all my specimens they are testaceous; the hind tibiæ are very hairy on both sides, and there is a strong blunt spur on their inner side at the extremity; the under-surfaces of the middle femora are armed with a row of very strong long spines.

#### T. INNOCUUS, Zett.

This species, which was also found by Mr. Verrall at Arran in June, 1882, is very similar to the former in general shape and colour; but has the eyes in the male more closely contiguous, and is destitute of the spur at the end of the hind tibiæ, as well as of the spines beneath the middle femora; the hind tibiæ are furnished with hairs on their sides in a very similar manner to those of *T. hirsutulus*.

#### CHORTOPHILA, Macq.

##### C. CURVICAUDA, Zett.

This minute species (only about 3 mm. in length) possesses several well marked characters: the forehead and face are prominent; the thorax is dull grey and indistinctly striped; the abdomen in the male is sub-cylindrical and greyish-black, becoming glabrous towards the apex; the anal segments are globular, dilated and reflexed; the wings are somewhat nigrescent, especially at the base, and armed along the whole costa with short spines. The female has the eyes only moderately separated, and the abdomen (which is ovoid and pointed) of a shining brown-black colour, with a metallic lustre.

This little fly was captured abundantly at Shiere, near Guildford, in Surrey, by Dr. Capron, in April, 1888, who kindly sent me several specimens of both sexes.

#### PEGOMYIA, R. Desv.

##### P. FLAVIPES, Fall.

This fly is distinct from the *P. flavipes* of Desvoidy and Macquart, a species which I do not know.

##### P. TRANSGRESSA, Zett.

Miss R. Prescott-Decie sent me a male of this rare fly in April last, which she had captured near Chagford, South Devon, in May, 1888. It has not yet been recorded as British. The antennæ and palpi are black; the eyes in the male are contiguous, and the triangular space between them above the antennæ is red. The thorax is cinereous and indistinctly striped. The abdomen is fusco-ferruginous, linear, and depressed with very large complicated yellow subanal processes. The legs are testaceous, with the exception of the fore femora, which are partly nigrescent, and the tarsi, which are black.



1<sup>o</sup> — F. Calvert.

*Sarcophaga Lineata.* (Murt.)

' 2<sup>o</sup>. H. Meade.

*Dilophus.* (Murt.)

1882.

*Erasmus* -



jumping-fish (*Periophthalmus modestus* Siebold), or the "Tobihaze" as the Japanese call it. This fish is more truly amphibious than the frog, for it is able to change the mode of its respiration at pleasure, breathing water and air alternately. It is accustomed to spend a great part of the time out of water, and actually appears to prefer the air to water. If one attempts to capture it, it rarely, if ever, plunges into the water, but skips along the surface. It can climb up the steep sides of rocks or plants, and jumps along the shore in quest of insects and other small animals, with the agility of a frog. When out of water, it puffs up the cheeks with air, which is held for a short time and then renewed.

ZONES OF LIFE IN THE OCEAN.—Mr. A. Agassiz, in the third volume of the report of the scientific results of the voyage of the *Challenger*, recognizes three belts or zones of life from shore to the greatest ocean depths. The following extract is taken from the Harvard University Bulletin No. 21. "The discovery by Count Pourtales, in his first dredgings off the Florida reefs, of ancient forms closely resembling types and genera characteristic of the chalk, first suggested the probability of the theories which looked upon the oceanic basins as of very ancient origin, and of their having retained practically unchanged the limits they now occupy from the time of the later Jurassic period. This ancient facies of many of the deep-sea Echini has also been traced in other groups of the animal kingdom. Professor Alph. Milne Edwards, in some of his preliminary reports on the Crustacea of the *Blake* calls special attention to the resemblance of some of the deep-sea types to the Jurassic and Cretaceous forms.

"In making a comparison of the bathymetrical belts, Mr. Agassiz has found it convenient to recognize three such belts which are mainly dependent for their characteristics on their temperature; pressure, representing great depth, apparently being a very unimportant element in the distribution of the species.

"The first belt, the littoral, extending from low-water mark to a depth of about 100-150 fms., represents what is usually known as the continental line (the 100 fm. line). It is the plateau which is found to represent the extension of the coast line to a depth at which the influence of the direct action of the sun's heat is limited. The next or "continental belt," extends from this continental line to a depth of 450-500 fms., and represents the steep slope which has been subject to greater or less disturbance during the formation of the shore deposits and of the continental plateaus while they were assuming little by little their present outlines; it represents also the bathymetrical belt, in which the diminution of temperature is very rapid, the third belt, the abyssal region, extends from the continental limit to the greatest depths which have thus far been obtained. This region embraces the great oceanic floors where life is somewhat less abundant than along the continental belt, where the detritus carried to its slope supplies abundant food to

the animals living within its limits. It is also a region in which the temperature is very low, where it varies but little from the freezing point, and where the conditions under which the animals now living there have probably remained undisturbed for a considerable period of time, geologically speaking. It is in this abyssal region that we find the greatest number of forms having an ancient facies. In the continental belt they are less numerous, and their resemblance is more with the types of the later geological periods."

STELLER'S MANATEE.—In his "Voyage of the *Vega*," Baron Nordenskjöld has collected all information attainable on Steller's sea-cow (*Rhytina Stelleri*), which on Steller's visit to Bering island in 1741, was found pasturing in large herds on the abundant seaweeds on the shores of the island. Twenty-seven years after, not a specimen was to be found, and it was believed to be then extinct. But Baron Nordenskjöld adduces evidence to prove that a specimen was seen twenty-seven years ago, though there can be little doubt that it has really gone the way of the mammoth. The Baron does not believe that its extinction is due to the destruction by hunters, but that it was a survival from a past age doomed to extinction, which overtook it when driven from its pastures on the shores of Bering island.

Steller's sea-cow (*Rhytina Stelleri* Cuvier) in a way took the place of the cloven-footed animals among the marine mammalia. The sea-cow was of a dark-brown color, sometime varied with white spots or streaks. The thick leathery skin was covered with hair which grew together so as to form an exterior skin, which was full of vermin and resembled the bark of an old oak. The full-grown animal was from twenty-five to thirty-eight English feet in length and weighed about sixty-seven cwt. The head was small in proportion to the large thick body, the neck short, the body diminishing rapidly behind. The short foreleg terminated abruptly without fingers or nails, but was overgrown with a number of short thickly placed brush-hairs; the hind-leg was replaced by a tail-fin resembling a whale's. The animals wanted teeth, but was instead provided with two masticating plates, one in the gum, the other in the under jaw. The udders of the female, which abounded in milk, were placed between the fore-limbs. The flesh and milk resembled those of horned cattle, indeed in Steller's opinion surpassed them. The sea-cows were almost constantly employed in pasturing on the sea-weed which grew luxuriantly on the coast, moving the head and neck while so doing much in the same way as an ox. While they pastured they showed great voracity, and did not allow themselves to be disturbed in the least by the presence of man. One might even touch them without their being frightened or disturbed. They entertained great attachment to each other, and when one was harpooned the others made incredible attempts to rescue it.



ZOOLOGICAL NOTES.—Professor Felix Plateau gives directions for the rapid preparation of large myological preparations, of which we copy his abstract: 1. Maceration in alum during dissection; 2. Wash with pure water; 3. Tint with carmine; 4. Fix the carmine with alum; 5. Maceration in phenicized glycerine; 6. Suppression of the excess of glycerine by compression between absorbent paper. The article is published in full in the Proceedings of the French Association for the Advancement of Science, 1880.—Professor B. G. Wilder has published in the Proceedings of the American Philosophical Society the anatomy of the brain of the cat, accompanied by numerous figures.—Professor Owen lately read a paper before the Linnean Society on the homology of the conario-hypophysial tract, or the so-called pineal and pituitary glands. He propounds the view that it is the modified homologue of the mouth and gullet of invertebrates; that the subœsophageal ganglia and succeeding nervous cord constitute the centers whence are derived and caudally continued the homologues of the vertebrate myelon.—Mr. W. A. Forbes exhibited at a late meeting of the London Zoölogical Society horns of the prong-horned antelope (*Antilocapra americana*) lately shed by the specimen living in the society's garden. This was, it is believed, the first instance on record of the same individual having shed its horns in captivity in two consecutive years. He also read a paper on the existence of a gall bladder in barbets and toucans. From the peculiar form of the gall bladder in these birds, as well as other features of their myology which he describes, the relationship of these birds to the woodpeckers becomes still more evident than previously stated by Nitzsch, Kessler, Garrod and others.—The last number of the *Memoirs* of the Boston Society of Natural History contains descriptions, with excellent figures on three plates, of new Hycroids from Chesapeake bay, by Professor S. F. Clarke. A new genus (*Calyptospadix cerulea*, n. sp.), is described. The most interesting of the six forms is *Stylactis arge*, "which has the remarkable habit of dividing its hydranths by a transverse partition, leaving the distal half free, which latter, with its two or three hydorrhizal processes that are developed before the division takes place, floats away free, being carried about by currents; finally it settles down, becomes attached, and by growth and budding gives rise to a new colony. It is another method in which the Hydroids are already so rich, by virtue of which they increase their numbers and their geographical distribution."—The Peabody Academy of Sciences has resumed the issue of its *Memoirs*. Vol. 1, No. 5, is devoted to Contributions to the Anatomy of Holothurians, by Mr. J. S. Kingsley; and No. 6 to Mr. J. W. Fewkes' development of the pluteus of Arbacia, which differs in certain details from that of Echinocidaris as worked out by J. Müller.—At a recent meeting of the Linnean Society of London, Professor Cobbold exhib-

ited a large Guinea worm taken from a pony, in Madras. Only one previous instance of the occurrence of this parasite in the horse has been mentioned, and its authenticity has been doubted.—Kossman in *Zoologischer Anzeiger* states that the *Entoniscus*, a parasite Isopod, is an endoparasite; these Isopods are usually external parasites.—C. P. Sluiter in the same journal describes the segmental organs in certain Sipunculidæ from Malaysia.—Further additions to our knowledge of the fishes of Lower California and the Gulf of California are recorded in the Proceedings of the U. S. National Museum by Messrs. Jordan and Gilbert.—Another paper of value in the same serial is that of Mr. Dall on the genera of Chitons, especially the fossil forms.—An elaborate account of the structure and development of the gar pike by Messrs. Balfour and Parker, read before the Royal Society, is reported in *Nature*. As regards the skull the authors say that its morphology cannot be understood “unless it be seen in the light derived from that of the Elasmobranchs, the sturgeon, and the anurous larva on one hand, and that of *Amia calva* and the Teleostei on the other.”—P. Geddes gives in *Nature* an abstract of an important paper on animals containing chlorophyll, such as Spongilla, Hydra, and certain Planarians, while others as Actinia, &c., contain chlorophyll originating from minute algæ which he calls *Philozoön*, which inhabit these animals. The same discovery was recently published by Dr. Brandt, so that both observers independently arrive at nearly the same conclusions, M. Geddes, however, differing in some important particulars.

#### ENTOMOLOGY.<sup>1</sup>

CARNIVOROUS HABITS OF MICROCENTRUS RETINERVIS.—I noted a circumstance on Sunday, October 23, which to me was very interesting. On what is called Mill island, in the Mississippi, two miles above Burlington, there are a number of burr oaks clustered on the extreme point of the island. The trunks were covered with thousands of *Megilla maculata* Deg. A large number of Locustidæ, I think *Microcentrus retinervis* (as near as I can determine them), were apparently feeding upon the beetles. It was so much aside from the habits of the Locustidæ, as I thought them to be strictly herbivorous, that I watched them very closely. They seized the beetles with their front legs, holding them in the same manner as a squirrel its food, and kept biting until the wing covers were broken through, then masticated the abdomen. I took a number of fragments of the beetles as they were cast off, so I could not be deceived.—H. G. Griffith, Burlington, Iowa.

NOTE ON THE FIRST INSECT FROM WRANGELL ISLAND.—Dr. I. C. Rosse, of the *Corwin*, has given me a small spider and a dried

<sup>1</sup> This department is edited by PROF. C. V. RILEY, Washington, D. C., to whom communications, books for notice, etc., should be sent.

larva, which he picked up during a short visit of the *Corwin* to Wrangell island. As the officers of the *Corwin* were the first persons ever known to have landed upon this island, it is probable that these are the first insects from that locality, and it may therefore be interesting to note that the spider has been identified by Mr. Geo. Marx, of the Department of Agriculture, as "an undescribed species of *Erigone*," the larva being probably lepidopterous, but in too poor condition for determination.—*J. H. Kidder, Washington, February 6th, 1882.*

LICHTENSTEIN'S THEORY AS TO DIMORPHIC, ASEXUAL FEMALES.—The translation into French by our friend, M. Jules Lichtenstein, of Dr. Adler's renowned paper on Dimorphism in Cynipidæ will be very welcome to all those who do not understand the German language, especially as the original and admirable plates are reproduced. We have already noticed Adler's discoveries. In the preface to the translation which Lichtenstein gives, is a very amusing illustration of the insufficient and misleading nature of his theory regarding the evolution of the Aphididæ, where he insists on calling the winged females *larvæ*, and their eggs *pupæ*, since he carries the analogy into the Cynipidæ, and would call the asexual females larvæ. He draws what he conceives to be proof of the correctness of his theory from the hypermetamorphoses of the Meloidæ, designating the coarctate larva as a pupa and implying that it shows the eyes, legs and jaws of the perfect insect, and yet produces instead of a perfect insect a larva like that from which it was formed. The error in this comparison lies in calling the fourth larval stage the pupa, when it has nothing to do with the pupa, but is simply a quiescent larva indicating none of the members of the perfect insect. It is in fact, as we have called it, a *coarctate larva*, and the eyes, legs and jaws represent those of the larva and have simply become rigid, whereas those of the perfect insect, as subsequently foreshadowed in the true pupa, have a quite different aspect, and we fail to see how this coarctate larva form can be compared with an asexual female Cynips any more than with a female of the bisexual generation. The translator's work is admirably done and he adds an instructive catalogue of the known species of Cynipidæ at the end.—*C. V. Riley.*

NAPHTHALINE CONES FOR THE PROTECTION OF INSECT COLLECTIONS.—Mr. C. A. Blake, of Philadelphia, has been preparing cones of naphthaline run around a pin so that they may be stuck into a box with insects and that the naphthaline may permeate the box and last for a considerable time. They are made after a formula recommended by Drs. LeConte and Horn, and are very convenient to handle. They gave such promise of usefulness that we obtained quite a lot of them and went to the trouble of supplying all our insect boxes with the same. We have speedily

rejected them, however, and give this note of warning, especially to lepidopterists to whom they will prove particularly objectionable, as our experience of a few weeks suffices to show that they very quickly encourage greasing, and soon produce a relaxed sordid or greasy appearance of the insects. Another objection is, that by deliquescence the pale chocolate color of the cones communicates to, and discolours the lining of the boxes wherever it comes in contact therewith. They may not be so objectionable for Coleoptera and Hemiptera, though in many families they would certainly prove injurious. We much prefer the old method of protection, viz: the pouring in the box of a little pure benzine, or what is better, according to LeConte's formula, a mixture of 1 oz. nitro-benzole, 1 pint alcohol,  $\frac{1}{2}$  oz. carbolic acid and 1 pint pure benzole.

**INJURIOUS INSECTS IN CALIFORNIA.**—Our California friends are very active in their warfare with the increasing number of their insect pests, and Mr. Matthew Cooke, chief executive horticultural and health officer, has recently sent us a neatly bound little treatise on the insects injurious to fruits and fruit trees of California, giving a good deal of valuable practical information which must be productive of great good. Mr. Cooke lays no special claim to entomological knowledge, and several determinations are erroneous. It is doubtful, *e. g.*, whether *Clisiocampa americana* or *Orgyia leucostigma* occur on the Pacific coast, and other species of these genera must be intended; while the determination, as *Nematus similis*, of a saw-fly larva injuring pear trees is made without any warrant, so far as we can find, the insect which we have bred from cocoons sent us by Mr. Cooke, proving to be something quite different. These technical shortcomings do not, however, impair the practical value of the manual.

**SARCOPHAGA LINEATA DESTRUCTIVE TO LOCUSTS IN THE DARDANELLES.**—From communications by Mr. Frank Calvert to members of the London Entomological Society, and a report of a committee appointed by said society to inquire into the matter, it appears that *Edipoda cruciata* Charp., which is the destructive species there, is preyed upon by parasites closely related to those which attack our *Caloptenus spretus*, and very much in the same way. Two Dipterous species are worthy of note, viz., a flesh-fly, (*Sarcophaga lineata* Fall.) and a bee-fly (*Callostoma fascipennis* Macq.). Of the *Sarcophaga*, Mr. Calvert remarks:

“I beg leave to call your particular attention to the larva that is found in the body of the locust, no longer a matter of doubt. Each locust has from one to three of these larvæ, which are seen on tearing open the neck and thorax. When the locust dies the larva, which is very active, leaves the body and buries itself in the ground with haste—proved by experiments I have made. The head is provided with a couple of black hooks which can be drawn in; these hooks are used when the larva is in motion, and to bury itself.



After a few hours the larva loses its liveliness in the ground. I have no pods at present to try if the larva feeds on the eggs of the locust.

A remarkable coincidence with the appearance of the parasite is the melting away of the immense swarms of locusts that were hatched; it is true some were devoured, but the great masses have died before the deposit of the egg; the country so freed round us is about twenty miles by forty. It is difficult to find locusts for specimens! \* \* \* The body parasite has destroyed the locusts that escaped the *Callostoma* over 800 square miles.

PARASITIC DIPTERA.—To the parasitic Diptera that are already well known, *Dilophus*, a genus of *Bibionidæ*, should, it appears now be added as, according to Mr. R. H. Meade of England, it has recently been bred from larvæ of *Chætoptria hypericana*. The *Bibionidæ* have hitherto been known only as vegetable feeders in the larva state.

DORSAL LOCOMOTION OF *ALLORHINA NITIDA*.—In the October, 1879, number of the *Canadian Entomologist*, I published a note on the larvæ of *Lachnosterna fusca*, remarking on the numbers in which they occurred in the lawn in front of the Capitol at Washington, and describing the peculiar manner in which the larvæ moved when placed upon a smooth surface—immediately turning upon their backs and moving forward with considerable rapidity by the alternate contraction and expansion of the segments. The specimens were determined for me as *Lachnosterna* by an experienced coleopterist; but the next year, by the rearing of the adult, they were proved to have been *Allorhina nitida*. Professor Riley had meanwhile called my attention to the fact that in Le Baron's fourth report, he had figured the larvæ of the latter species upon its back and in the act of progression. The statement is also made in this report that this larva "when out of the ground crawls with ease on its back."

This interesting habit is not confined to this species, as Rev. Samuel Lockwood, in the *AMERICAN NATURALIST*, 1868, mentions the same fact of the full-grown larva of *Cotalpa lanigera*, stating, however, that the young larvæ walked normally upon their legs. Other Scarabæid larvæ will doubtless be found to share in the same habit.—*L. O. Howard*.<sup>1</sup>

MODES BY WHICH SCALE-INSECTS SPREAD FROM TREE TO TREE.—I watched to-day a colony of *Hyperaspidius coccidivorus* Ashmead which has for two months or more been increasing on the trunk of a tall seedling orange tree. The main trunk of the tree is covered densely with Chaff scale,<sup>2</sup> and upon it the larvæ and imago of the beetle are feeding. The greater number are now in imago. I found but one pupa although larvæ are still abundant. The

<sup>1</sup> Mr. W. Kite of Germantown, Philadelphia, sent to *NATURALIST*, some months ago, a description of the same habit.

<sup>2</sup> *Parlatoria Pergandii* Comstock.—ED.

beetles, both larva and imago, feed upon the Coccids in all their stages. They never bite through or tear off the scale, but seem to push their heads under, between the bark and the scale. Larvæ of the scale-insect are quite abundant on the trunk, and these are sucked by the Coccinellid. Although this is not properly a breeding time of the scale, there are considerable numbers of scale larvæ wandering about, and I noticed again and again that they frequently mount upon the bodies of the Coccinellids while the latter are feeding and without attracting the attention of the beetle. It even seems to me that they are attracted by the smooth and shining surface of the *Hyperaspidius*' elytra, as I sometimes saw three or four of the scale larvæ together upon the back of a single individual of this extremely small beetle. As several large Coccinellids, *Chilocorus bivulnerus*, et al., are extremely common in all our groves, and all feed more or less upon Coccids, it does not seem surprising that the scale should spread from tree to tree. Another method of transportation has recently occurred to me. The shrike or butcher bird is very fond of selecting orange thorns as places to store insects. The bird is extremely common, and of course preferably selects orange trees that have long straggling branches, in fact, precisely those that are most thickly infested with Long scale. I know of one grove, much infested with scale and where at any time may be collected a double handful of dead or living insects (Orthoptera and common beetles like *Phanæus*) from the orange thorns upon which they have been impaled. The thorns on infected branches are always thickly coated with long scale, and in impaling a hard shelled insect like *Phanæus* many scales are torn off, and both scales and their eggs adhere to the insect. The shrike sometimes transfers the insects it has impaled upon one tree to a thorn upon another tree, or after making a meal of its prey which it takes off of a thorn, the bird flies off and wipes its bill on the next tree. In this way as well as upon its feet, the bird must spread scales from tree to tree.—H. G. Hubbard, *Crescent City, Fla., Dec. 12, 1881.*

#### ANTHROPOLOGY.<sup>1</sup>

CHARNEY ON THE AGE OF PALANQUE.—I am strongly inclined to agree in the main, though not entirely with Charney's opinion in reference to the age of Palanque as expressed in the October number, 1881, of the *North American Review*. But the inscription on the tablet presents a serious difficulty to his supposition that it was of Toltec origin, unless Toltec and Maya be the same.

This is undoubtedly Maya, as it is not difficult to show that at least fifty of the characters are the symbols or hieroglyphs of Maya days and months with accompanying numerals. The large initial at the upper left-hand corner is probably the hieroglyph of the word *Pacumchac*, the name of a great religious festival held in

<sup>1</sup> Edited by Professor ORIS T. MASON, 1305 Q. street, N. W., Washington, D. C.



R. H. Meade.

1886.

*Cerastinostoma. Maritimum.*



DESCRIPTION OF A NEW MARITIME FLY BELONGING TO THE  
FAMILY SCATOMYZIDÆ, FALLEN.

BY R. H. MEADE.

The following Dipteron occupies a position intermediate between those in the genera *Scatophaga* and *Cordylura*. It has the elongated horny proboscis with the numerous vibrissæ, of the species in the former genus, and the sub-cylindrical, incurved, clubbed male abdomen of those in the latter.

I propose to place it in a new genus, which I shall call *Ceratinostoma*. Schiner describes a new *Cordylura* (*lurida*), which, from his account, should also be placed in the new genus.

CERATINOSTOMA, *g. n.*

Gen. ch.—*Caput modice latum; oculi sub-rotundi, genas ne longe tegenti; antennæ breves, truncatæ, epistoma distantes; arista tenuis, plumata, articulo secundo producto, et spissato; setæ orales plures; proboscis elongata, acuminata, cornea; palpi longi, filiformes, sub-clavati. Thorax ellipticus. Abdomen 6-annulatum, mare sub-cylindricum, fusiforme, apice incurvato clavato, feminâ sub-ovatum, ano acuto. Scutellum 4-spinosum. Alæ abdomine longiores. Pedes validi, tibiis setosis. Corpus parce pilosum.*

*C. MARITIMUM, sp. n.: Scatoph. oceanica Mead.*

*Plumbeo-nigricans opacum, thorace olivario-fusco pollinoso, sub-striato; palpis pallidis, breviter nigro-setosis; proboscide nigro-picea; pedibus plumbeis, tibiis posticis intus villosis, tarsis omnibus subtus fulvo-hirtis. Long., ♂ et ♀, 8 mm.*

Head: eyes rather small, oval, widely and nearly equally separated in both sexes; frontal stripe black, having a brownish tinge on the vertex, and being velvety black in both sexes in front over the antennæ; face extending somewhat obliquely backwards; epistome but little prominent; cheeks extending below the eyes, having their front part, together with the face, of a silvery-white colour with blue reflections; hinder part of the cheeks, with the occiput, bluish-black, clothed with soft tawny hairs; frontal bristles extending in a single row along each side of the frontal stripe, from the vertex to the base of the antennæ; those in the posterior half of each row turning outwards, and those in the front half inwards; oral setæ rather short, six to eight in number on each side; antennæ black, the first joint abbreviated, the second somewhat elongated, having a reddish-brown or grey tinge, with white reflections on the distal margin, and armed with short black bristles; the third joint oblong, rounded or blunt at the end, and about one and a half times as long as the second; arista short and mostly somewhat geniculated, the first joint abbreviated, the second two or three times longer than the first, and together with it considerably thickened and clothed with short pubescence; the third joint slender, four or five times longer than the two others together, feathered with yellowish hairs

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of moderate length along its basal half, and having the distal half or apex bare; proboscis pendulous, rather longer than the depth of the head, pitchy-black, horny, with the apex pointed in front, and having two small lips turned backwards. Palpi clavate, nearly as long as the proboscis, whitish-yellow, clothed with short black bristles, and long soft tawny hairs. Thorax of a dull lead or slate colour, somewhat arched, having a distinct transverse suture, and clothed on the dorsum with short thick tomentum of an olive or tea-green colour, which is arranged in irregular shaped but symmetrical patches, broken at the suture; leaving a central longitudinal pale stripe and a pale spot on each shoulder; there are only a few fine setæ on the dorsum, but a number of shortish strong spines irregularly distributed on the sides. Scutellum slate coloured, with some olive-green tomentum on the sides and apex; having four long setæ and numerous short black hairs. Abdomen oblong-ovate (spindle shaped), and sub-cylindrical in the male, with the apex incurved and thickly clubbed, the hypopygium being large and furnished in front with two black, horny, pointed processes; in the female oval, and pointed at the extremity; it is of an uniform dull leaden colour in both sexes, immaculate, and almost smooth, having only a few minute black hairs on the surface; there are six segments, the first is very short, and so closely joined to the second, that they look like a single long one; the third, fourth and fifth are nearly equal in length, and so is the sixth in the female, in the male it is globose and partly incurved; in some specimens the posterior edges of the segments have a pale yellow tinge. Wings rather long, of a pale yellowish-brown colour, with black veins; the third and fourth longitudinal veins diverge gradually from each other from the site of the internal transverse to the apex of the wing, which is placed almost in the centre between their points; the internal transverse vein is situated a little beyond the point of termination of the second branch of the first longitudinal, and considerably beyond the middle of the discoidal cell; the external transverse is straight and upright, placed nearly one-third nearer to the internal transverse than to the extremity of the fourth longitudinal; the costal vein is very slightly ciliated and without spine. Alulets small, white, with yellowish-brown margins, and ciliated with long pale yellow hairs. Halteres with brown stiles, and yellowish-white knobs. Legs of an uniform slate-grey colour, with large whitish pulvilli and long black claws; the tibiæ are all armed with numerous long bristles in both sexes, but the coxæ and femora are almost destitute of setæ; the front surfaces of the fore coxæ, and the under-surfaces of the mesosternum (triangular plate between the fore and middle coxæ), as well as those of the hind coxæ, are clothed with tufts of soft yellow hairs; the fore-legs have the femora somewhat thickened, and furnished with short soft yellow hairs on their under-surfaces, mixed with short black ones, which also cover their outer and upper sides; the tibiæ have four or five long bristles projecting from the distal halves of their under-surfaces; their outer sides and extremities are also armed with a number of spines; the middle of the inner and under-surfaces is also clothed with short adpressed golden-yellow hairs, which extend along the whole under-surfaces of the tarsi; the middle legs have the femora almost smooth, the tibiæ armed with a few spines or bristles; and the tarsi similarly but more shortly clothed with yellow hairs than in the other legs; the hind-legs have the femora clothed with short soft yellow hairs on their under-surfaces, and have a few short black spines along their upper and outer sides, which are also covered with short black hairs; the tibiæ are somewhat curved, are

furnished along their inner surfaces in both sexes with soft black hairs of moderate lengths, and are armed on their outer sides and ends with long black spines; the inner extremities of the tibiae, and under-surfaces of tarsi, are clothed like the other tarsi with golden hairs.

This interesting fly seems to be widely distributed on the British coast, but is of rare occurrence. It lives among the remains of sea weed and other marine rejectamenta above high water mark. The first specimens I saw were kindly sent to me for identification by Mr. W. H. Harris of Cardiff,\* who captured them on the Welsh coast, in September, 1884. He found another pair near Cardiff this last summer (1885), and also a single specimen at Ilfracombe in July. I captured a pair myself (♂ & ♀) at Douglas, Isle of Man, on June 20th, 1885, in company with numerous specimens of *Eucellia fucorum*, *Scatina litorea*, and other marine flies; but though I searched carefully on many subsequent days, I never met with another individual.

Bradford, Yorks. :

November, 1885.

This fly I afterwards found had been described by Haliday under the name of *Scotopsa astorum*. My specific name must therefore lapse into a synonym but the generic name will remain.

M. H. Thoms

\* The author of some interesting papers, with excellent illustrations, upon the *teeth* of flies, published in "Science Gossip."





- 8 (7) Length,  $2\frac{1}{2}$ —3 lines; the 3rd and 5th segments banded with yellow; head transverse; vertex scarcely emarginate ..... *pusillus*.  
 9 (3) Abdomen with a row of triangular yellow spots along the sides; none of the segments banded ..... *tabidus*.

4. CEPHUS ARUNDINIS, Giraud (vol. ii, pl. vii, fig. 3),  
 = *quadricinctus*, Thoms., = *filiformis*, André.

The one spine on the hind tibiæ (which are black), the greater number of yellow bands on the abdomen, the cubical head emarginate behind, and the closely punctured head and thorax, easily separate this species from the others in this section. The greater extent of the yellow coloration on the face of the ♂, and the yellow front legs make it easy of identification.

5. CEPHUS PHTHISICUS, Fab., *In Act. v. J. 1836*  
 = *pallipes*, Htg., = *cultrarius*, Htg., = *immaculatus*, Ste. *1836. Par.*  
 A distinct and common species.

6. CEPHUS TABIDUS, Fab.,  
 = *longicollis*, Fourc., = *mandibularis*, Lep.

The row of yellow spots on the abdomen of this species makes it easy of recognition.

7. CEPHUS TROGLODYTA.

This is a larger species than *pygmæus*; the antennæ are shorter and less thickened towards the apex; the yellow bands on the abdomen are narrower, and there is no yellow on the last segment; the stigma and nervures are testaceous, not black, as in the common species; the ♂ is readily known by the black breast; the legs do not differ in coloration from those of the ♀.

8. CEPHUS PYGMÆUS, Lin.

The common and destructive species.

9. CEPHUS PUSILLUS, Ste.

I believe this is a distinct species. It differs from *pygmæus* in being smaller, in the antennæ being longer and brownish towards the apex; there are only two yellow bands on the abdomen in the ♀, and the posterior tibiæ and tarsi are yellowish-testaceous; the costa and stigma are lighter in colour, the transverse radial nervure is received nearer the apex of the 2nd cubital cellule, which is shorter compared to the 3rd. The ♂ is readily known from that of *pygmæus* by the breast and pleuræ being quite black. It resembles the ♂ of *pallipes*, but its abdomen is shorter and broader, and has not so many, nor so broad, yellow bands; and the 2nd cellule is distinctly longer compared to the 3rd.

NOTE ON *CERATINOSTOMA MARITIMUM*.

BY R. H. MEADE.

Since my description of this Dipteron appeared in the last number (December, 1885) of this Magazine, my friend, Herr Röder, of Hoym,\* has informed me that he has taken this insect on the sea-shore at the island Nordeney, and believes it to be identical with the *Scatophaga oceana*, of Macquart, who described and figured it in 1838 in the 7th vol. of the *Annales de la Société entomologique de France*. | Mac- 194  
quart's description is very short, so I will transcribe it:—

“*SCATOPHAGA OCEANA*, Nob.

(Pl. xi, fig. 2).

*Obscure virescens, palpis flavidis; antennis nigris, stylo hirsuto; pedibus nigris.* Long., 3 lin.,  $\frac{1}{2}$ .

Face blanche; thorax à quatre bandes brunes; les deux latérales contiguës, une tache grise sur la suture; ailes hyalines, nervures longitudinales et transversales bordées de brunâtre pâle. (La plage de Dunkerque).”

He adds that this fly is less hairy, has the forehead less prominent, and the third joint of the antennæ, together with the style, shorter than in the ordinary species of *Scatophaga*, in all which respects it will agree with *C. maritimum*, but he says nothing about the shape of the male abdomen, and seems to have described and figured a female specimen only. In the *Wiener entomol. Zeitung*, vol. iii, p. 290, Herr Röder published some remarks upon the synonymy of *Scatophaga oceana*, Macq., in which he says that he considers it to be identical with *Scatomyza borealis*, Zett., and *Scatophaga ostiorum*, Hal., which last was very briefly described in Curtis' “*British Entomology*.”

Assuming that these opinions are correct, my name of *maritimum* must be superseded by that of *oceanum*, but the remarks which I made in my paper upon the necessity of forming a new genus for the reception of this species will remain in force, and the synonymy will stand as follows:—

*CERATINOSTOMA*, Meade.

*oceana*, Macq. (*Scatophaga*).

*ostiorum*, Hal.

*borealis*, Zett. (*Scatomyza*).

*maritimum*, Meade.

Bradford, Yorks.:

December, 1885.

\* Who is noted for having one of the largest collections of *Diptera* in Europe.

# DESCRIPTION OF THE ASH-CAULIFLOWER GNAT.

BY R. H. MEADE.

*DIPLOSIS FRAXINELLA*, *sp. n.*

*Cecidomyia minuta*?, Winnertz.

*Flava, thorace nigro-striato; abdomine basi-nigro; halteribus albis, amplisque; alis, venis cubitalibus prope apicibus exeuntibus.* Long. ♂ et ♀  $\frac{2}{3}$  mm.

*Head* black; palpi and proboscis pale yellow; face with a tuft of white hairs; antennæ in male about one and a half times the length of the insect, consisting of 2 basal joints which are yellow and sessile, and of 24 moniliform pedicelled ones, of a pale brown colour, verticellated with white hairs; the stalks are about as long as the joints: in the female the antennæ are nearly as long as the body without the oviduct, and consist of 2 basal joints as in the male, and of 12 ovoid very shortly pedicelled others, to which a minute, tapering, terminal one is added.

*Thorax* brownish-yellow, marked with three longitudinal brownish-black stripes, which are almost confluent in the male, so that the dorsum looks nearly black; in the female the middle stripe is broad, while the lateral ones are very narrow.

*Abdomen* yellow, clothed with white hairs, and having the base blackened; the black part is more distinct in the female than in the male, especially upon the upper-surface; forceps of male large and yellow; oviduct of female wanting.\*

*Halteres* large and white.

*Wings* clothed with dark hairs; second longitudinal or cubital vein almost straight until it nears the extremity, when it curves rather suddenly down; and reaches the border apparently slightly before the apex; anal vein very indistinct.

*Legs* with trochanters very pale, the other joints are clothed upon their upper-sides with black hairs, which are most numerous upon the tarsi, which look darker than the rest of the legs; the under-surfaces are furnished with white hairs, so that the legs look white beneath.

This very minute Cecid is probably the same as the one described by Winnertz under the name of *C. minuta*. It is rather an anomalous species, for though the antennæ are fully characteristic of the genus *Diplosis*, Lw., the direction of the cubital vein more resembles that of *Cecidomyia*, the point terminating apparently a little before the apex of the wing. Winnertz only knew the male of his *C. minuta*, and was ignorant of its life-history; it also differed according to his description from the male of the ash-gall *Diplosis*, by having the antennæ twice as long as the body, and the points of the forceps black; I have, therefore, thought it better to describe it as a new species, giving it a characteristic name.

Like some other species of *Diplosis* this one lives as an *inquiline* in the cauliflower ash-gall, where it was found by Dr. Chapman, in August, 1887, along with the larvæ of *Prays rustica*, and was kindly sent by him to me for identification.

Bradford, Yorks: August, 1888.

\* The only two specimens which I received were dried, in which state the male organs cannot be fully described.



R. H. Meade.

1891.

Mydosa. Homalomyia  
Limnophora.





To sum up, the families examined in this paper should, according to my opinion, be grouped as follows:—

## I. NEMOCERA.

Cecidomyidæ.  
Mycetophilidæ.

Culicidæ.  
Chironomidæ.  
Psychodidæ.  
Tipulidæ.  
(?) Dixidæ.

## II. NEMOCERA ANOMALA.

Bibionidæ.  
Simulidæ.  
Blepharoceridæ.  
Rhyphidæ.  
Orphnephilidæ.

## III. EREMOCHÆTA.

Stratiomyidæ.  
Tabanidæ.  
Acanthomeridæ.  
Leptidæ (plus Xylophagidæ).

I have prepared a more elaborate paper on the subject discussed here, to be published in the "Berliner Entomologische Zeitschrift." But I intend to hold it back for some time, in the hope of improving it through the study of exotic forms in some of the large European collections. This preliminary publication may in the mean time prove useful.

Heidelberg: *January*, 1891.

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INSECTS, &c., TAKEN IN THE NESTS OF BRITISH *VESPIDÆ*.

BY R. NEWSTEAD, F.E.S.

CURATOR, GROSVENOR MUSEUM, CHESTER.

Having collected all the British *Vespidæ* (except *V. crabro*) in the Counties of Cheshire and Denbighshire for our Museum, I deemed it necessary to work up their parasites, in order to make our collection more educational. In 1889 wasps were exceptionally abundant throughout our district, so I thought it a fitting opportunity to collect their nests for the above purpose.

I think the best plan for taking their nests is, to place a round stick of cyanide of potassium in the burrow leading to the nest in the evening, and to carefully stop the entrance afterwards with a pebble. Before 7 a.m. the following morning the nest should be taken, if not, the pebble must be removed to allow the benighted wasps to enter, of which there are always a goodly number. If the latter plan be adopted, the nest must be left until the evening, when it can be taken without the least danger of being stung.

All nests taken should be examined at once, and afterwards placed in large flowerpots with a small quantity of earth in them, covered with calico, and placed in a warm outhouse. These, of course, must

be examined from time to time for anything that may be hatched from them. The cyanide kills all imagines, no matter of what Order, but it seems not to effect the larvæ.

*Vespa germanica* and *V. vulgaris* were fairly abundant this year (1890), but not so numerous as last year; the majority of their nests, however, were exceptionally large. One nest of *V. germanica* measured  $15\frac{1}{2}$  inches in diameter, and weighed  $11\frac{1}{2}$  lbs.

The following is a list of the species taken:—

#### †CRUSTACEA.

*Porcellio scaber*, Latr.—turns up in almost every nest.

#### ACARIDA.

*Uropoda elongata*, Haliday.—new to us; seven attached to *Homalomyia canicularis* bred from a nest of *V. germanica*, Ince, Cheshire, October, 1889. Nymphal forms only.

*Glyciphagus spinipes*.—swarmed in nest of *V. germanica*, October, 1890, Chester "Cop."

Some nests of *V. germanica* simply swarmed with a species of *Tyroglyphus*, August to October, 1889, Cheshire and Colwyn Bay.

#### COLEOPTERA.

†*Leistus rufescens*, F.—one specimen from nest of *V. vulgaris*, Nant-y-glyn, Colwyn Bay, August, 1889.

†*Pterostichus vulgaris*, L.—one specimen in nest of *V. vulgaris*, Colwyn Bay, August, 1889; one in nest of *V. germanica*, Chester "Cop," August, 1890.

†*Bradycellus verbasci*, Duft.—three specimens in a single nest of *V. vulgaris*, Nant-y-glyn, Colwyn Bay, August, 1889.

†*Choleva tristis*, Panz.—two specimens in nest of *V. germanica*, Ince, Cheshire, October 10th, 1890; nest nearly deserted.

†*Homalota succicola*, Thoms.—three specimens in nest of *V. vulgaris*, Nant-y-glyn, Colwyn Bay, August, 1889.

*Quedius puncticollis*, Thoms.—three specimens in nest of *V. germanica*, October 10th, 1889; larvæ abundant in same nest. A few of these produced imagines the following April.

*Epuræa obsoleta*, F.—three specimens in nest of *V. germanica*, Colwyn Bay, August, 1890.

*Cryptophagus pubescens*, Sturm.—abundant in many nests of *V. germanica* and *vulgaris*, Colwyn Bay, and Ince, Cheshire, August, 1889, to April, 1890. *C. setulosus*, Sturm.—common in nests of *V. vulgaris*, Colwyn Bay, August, 1889; sparingly at Ince, Cheshire.

*Metæcus paradoxus*, L.—several in a single nest of *V. vulgaris*, Manley, Cheshire, August, 1889; these were taken by Mr. A. J. Nixon.

\**Thyamis lurida*, Scop.—one in nest of *V. germanica*, Colwyn Bay, August, 1889.

#### HYMENOPTERA.

*Aspilota concinna*, Hal.—in a single nest of *V. vulgaris*, Nant-y-glyn, Colwyn Bay, October, 1889.

*Proctotrupes* ?.—several specimens that may belong to this or an allied genus. They are very much at the service of any specialist. One in nest of *V. vulgaris*, October, 1889, and several from this and *V. germanica*, April, 1890, Colwyn Bay and Cheshire.

#### DIPTERA.

*Cyrtoneura stabulans*, Fall.—abundant in nests of *V. germanica*, August to April, Colwyn Bay, and Ince, Cheshire, 1889—90.

*Homalomyia canicularis*, L.—abundant in nests of *V. germanica*, very sparingly in nests of *V. vulgaris*, August to April, Colwyn Bay, and Ince, Cheshire, 1889—90. *H. resparsa*, Meade, *n. sp.*—I found the larvæ of this in the same nest as I did those of *A. inanis*. Not knowing at the time that it was new to science, I made no description of it. These only produced two perfect insects on the 26th of July, 1890. Mr. Meade says, "The species occupies an intermediate position between *Hom. scalaris*, F., and *Hom. coracina*, Lw." One specimen is in the collection here, the other in Mr. Meade's.

*Phora rufipes*, Meigen.—occurred in every nest examined, August and September, Colwyn Bay and Cheshire.

*Acanthiptera inanis*, Fall.—larvæ swarmed in single nest of *V. germanica*, October 10th, 1889; imagines hatched July, 1890; Ince, Cheshire.

*Tolucella bombylans*, L., var. *plumosa*.—larvæ most abundant in nests of *V. germanica*, Colwyn Bay and Cheshire, August to October.

I also found several specimens of *Lepidoptera* too worn for identification. At least three species of *Diptera* deposit their ova on the outer covering of the nest. I have found them on very many nests, but I am unable to say which of the species deposit them there.

Does it not appear very strange that such soft bodied insects as the *Diptera* dare venture into a wasp's nest without being protectively coloured? One can easily see that any insect conferring a benefit upon the wasps, by ridding their nests of dead larvæ, would be welcomed into their strongholds as friends and helpers. But when we find at least four species of the *Diptera* parasitic on the *Vespidæ* apparently without any protection whatever, one feels much puzzled, especially when we know for a fact that the *Vespidæ* feed upon the *Diptera*, and upon species too that are allied to *Anthomyia*. All the *Diptera* are diurnal, and therefore must of necessity enter the nests in the daytime in order to deposit their ova.

Except a few *Coccinella 22-punctata* found hibernating in an old nest of *V. britannica*, I have not taken any parasites from the nests of this species. I have not taken nests of *V. sylvestris* or *V. rufa*.

My best thanks are due to the following for their valuable help in determining the species:—Messrs. J. B. Bridgman, E. Bostock, R. H. Meade, Edwd. Saunders, and Rev. W. W. Fowler.

Grosvenor Museum, Chester:

December 5th, 1890.

† I think are mere intruders in search of food. Certainly not parasites.

\* Accidental visitor.

The other species seem to be true inhabitants, if not parasites.

## ADDITIONS TO THE LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

MYDÆA AFFINIS, *sp. n.*

♂. *Livida subnitida, cano-tomentosa; oculi contigui; thorax antice distincte, postice obscure, vittatus; abdomen linea dorsali tenui, tessellisque nigris ornatum; femora omnia (cum tibiis) flava.* Long., 8—9 mm.

This species bears such a close resemblance to *M. pagana*, Mgn., that I formerly considered it to be only a variety of that fly; but, after the careful examination of a specimen which I captured in June last, I have no doubt about its being distinct.

It is of a bluish-black colour, having whitish-grey tomentum on the thorax and abdomen. The eyes are coherent. The thorax is distinctly marked by four black stripes on its front half, but the lines become nearly obsolete behind the transverse suture. The abdomen is marked by a narrow longitudinal stripe in the middle of the upper segments, and also distinctly tessellated by irregular black spots or patches. The legs are entirely reddish-yellow, with the exception of the tarsi, which are black.

*M. pagana* varies in colour; the more common variety is covered with yellowish-grey tomentum, but in many examples this is of a whitish or bluish-grey colour. *M. affinis* resembles the latter variety in tint, but differs from both kinds in the following points: the eyes are coherent instead of being subcontiguous; the hinder part of the thorax is less distinctly striped; the dark abdominal patches or tessellations are much more marked; and the fore femora are entirely yellow, not blackened at the base as in *M. pagana*.

I captured two males of this species near Lake Windermere several years ago, and found another in June, 1890, at Grange-over-Sands, in Lancashire; also in the Lake District. I do not know the female.

HOMALOMYIA VESPARIA, *sp. n.*

♂. *Nigra subnitida thorace substriata, abdomine elongato-glaucis, maculis trigonis ampliis signato; oculi arcuè contigui; femora intermedia sub-buccata, subtus, barbata, basi nuda; tibiæ intermediæ tuberculo elongato plano, breviter ciliato, instructæ; tibiæ posticæ villosæ.* Long., 7 mm.

This species closely resembles *H. scalaris*, F., in size, shape, colour, &c.; it is also nearly allied to *H. coracina*, Lw. (*H. spissata*, mihi\*), but differs from them both in several well marked distinctive characters, which I will briefly point out.

The eyes are quite contiguous, while they are somewhat separated in *H. scalaris*, and also to a less degree in *H. coracina*. The antennæ and other parts of the head resemble those of *H. scalaris*. The thorax is black, shining, and indistinctly striped, as in both the other allied species. The abdomen resembles that of *H. scalaris*, being elliptical, rather more elongate than that of *H. coracina*, and marked as in *H. scalaris*, with much wider triangular dorsal marks than in *H. coracina*. The wings have the third and fourth longitudinal veins slightly approximated at their extremities, as in *H. scalaris*; they are almost parallel in *H. coracina*. The internal transverse veins are situated at some distance before the termination of the auxiliary vein, with the point of which they are placed in almost a straight line in both *H. scalaris* and *H. coracina*.

\* See the description of this species in Ent. Mo. Mag., vol. xviii, p. 203.

The legs are black. The front pair present no peculiar characters, but the intermediate ones have the femora somewhat swollen or dilated a little beyond the centre, their basal third is bare, but the middle and anterior portions are spinose beneath; the thickest and strongest bristles forming a sort of beard under the swollen portion of the joint. In *H. scalaris* the middle femora are of the ordinary shape (slightly thickened in the centre), and are bristled along their whole under-surface, the spines being concentrated into a tuft of very strong blunt bristles towards the middle. In *H. coracina* the bristles on the under-sides of the middle femora are less tufted than in the other two species, and extend from the base along the posterior three-fourths, leaving the distal or front part bare; there is also no abnormal thickening of the limb.

The middle tibiæ in *H. vesparia* have an elongated projection or tubercle on their inner sides, which occupies about two-fifths of the distal end; it is even in shape, and ciliated over the whole inner surface with short straight hairs, somewhat in the same manner as the corresponding tubercle in *H. armata*, Mgn., in which it is, however, larger, irregular in shape, and armed with longer hairs.

In *H. scalaris* the tibial tubercle is in the shape of a short thick lump at the inner end of the joint, and quite bare; in *H. coracina* it is somewhat similar in shape to that in *H. vesparia*, but more irregular upon the surface, and destitute of hairs, with the exception of a few soft ones on its lower part. The hind tibia are ciliated upon both sides much as in *H. coracina*; they are almost bare in *H. scalaris*.

Mr. R. Newstead, Curator of the Grosvenor Museum, Chester, kindly sent me a male of this species, which he had bred from larvæ which he had found in the nest of *VESPA germanica*, together with those of *ACANTHOPTERA inanis*, Fln., and *HOMALOMYIA canicularis*, L. The larvæ of the last named common fly seem to be common in wasp nests, and Zetterstedt mentions\* that they have also been found in those of *Bombus terrestris*.

The interesting question arises—what is the food of these larvæ in these nests? Those of *H. canicularis* and also of *H. scalaris* are well known to feed commonly upon ordure and various rotten vegetable matters, as decayed cabbage stalks. What do they find to eat in wasps' nests? They cannot be parasites upon the wasp larvæ. Do they eat the excrement emitted by these?

#### LIMNOPHORA LITOREA, Fln.

I captured two males of this well-marked species at Grange-over-Sands, Lancashire, in June, 1890. It has not yet, I think, been recorded as British; it is characterized by having the eyes in the male separated by a broad black line; by the antennæ being rather long, and having the arista very slightly pubescent; by the thorax being grey with whitish shoulders and sides, and marked on the dorsum with three somewhat confluent and indistinct stripes; the lateral ones broad and irregular (maculiform) in shape, and the middle one apparently made up of several narrow lines; by the scutellum being grey, with a black mark on each side; by the abdomen being of a clear grey colour, and marked with four moderate sized triangular spots. It is about 6 mm. in length.

Bradford, Yorkshire:

December 13th, 1890.

\* Dipt. Scand., t. xiv, p. 6251.



ON A BRAZILIAN SPECIES OF *ALEURODES* FOUND IN ENGLAND.

BY J. W. DOUGLAS, F.E.S.

*ALEURODES FILICIUM*.*Aleurodes filicium*, Goldi, Mittheil. schweiz. entom. Gesells., vii, 247 (1886).

*Pupa*. Subdiaphanous, pale greenish, oval, the sides anteriorly very slightly sinuous; within the margin all round a parallel line, the intervening space crossed by equidistant, straight lines; a second parallel line within the first, often indistinct, the space thus formed also crossed by lines closer and shorter than in the first zone; the two series forming a double row of subquadrangular meshes, which Goldi terms "doppeltem Fransensaum;" from this very faint, close lines proceed convergently to the disc, where the body of the insect beneath shows through; the margin, at times, with very small, close, obtuse dentation, and exterior to all the usual delicate, white, waxy, band-like secretion is attached to the margin, and being also adherent to the frond it is more or less broken off and left behind if the insect be raised. On the under-side are five pairs of strong, setaceous hairs, viz., one pair on the head, two on the sternum, and two on the abdomen posteriorly, all of them very long and mostly projecting beyond the margin. Eyes red. Length,  $\frac{1}{2}$  mm.

*Imago* ♀. White; abdomen more or less pale yellow, wings spotless; antennæ densely farinose, of seven joints; the 1st very small; 2nd much longer, stout, subclavate; 3rd longest of all, slender, joined to the 2nd by a short petiole; 4th to 7th shorter, subequal, filiform; eyes large, black, with minute white dots (facets) in rows, oval, but appearing long-reniform ("bean-shaped," Goldi), by reason of a granulated projection from the middle of the inner side.

Expanse of wings, 2.5 mm.

The foregoing agrees with Dr. Goldi's description (*l. c.*) except as regards the pupa in two small points, due doubtless to the stage of development of the insect when under notice; thus, the margin is less sinuate, and the second intramarginal line is not so continuous as in his figure. In the imago the antennæ are stated to have six joints, but there are really seven, which is the normal number in the genus, as Signoret has shown (Ann. Soc. Ent. France, viii, 369, 1868); in this case one of the articulations, which, on account of the white powder, and the transverse striæ when the antennæ are mounted in a transparent medium, are difficult to distinguish, appears to have been overlooked.

Of this distinct species, doubtless imported on ferns from a tropical country, many examples of pupæ and ♀ imago were obtained by Mr. S. J. McIntire, during September and October, in the tropical fern-house in the Royal Gardens, Kew, on the under-side of the fronds of ferns, chiefly *Oleandra articulata* and *Pteris quadriolata*. Dr. Goldi found the species on the under-side of the fronds of *Asplenium cuneatum* and other Brazilian ferns in the Botanic Garden at Rio de Janeiro, but of the perfect form only females, the reason in both cases being, probably, that the males fly off with greater agility, as is the habit in other species.

153, Lewisham Road, S.E.:  
October, 1890.



## THE HESSIAN FLY IN GREAT BRITAIN.

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It may seem almost supererogatory, since we are told by Dr. Herbert Loew, of Posen, that a "small library has been written on the subject of *C. destructor*," to attempt to add our mite to the vast store of information that has been worked out for us so generously and perseveringly by scientists in Europe and America. Dr. Packard tells us that the number of writers down to 1883 is fifty-six, and that number has certainly increased and multiplied itself, in proportion as the destruction caused by the gall-gnat has extended its area. It was detected, it would seem, in Europe in 1834, in the Island of Minorca, by Messrs. Dana and Herrick, though it has continued its ravages, with more or less of intermission, for really upwards of a century. In America it appears to have thriven indeed since 1776. And here let it be remarked that it has extended its ravages on a larger scale than in Europe—from the sea-board of the Atlantic to Kansas, and from the Gulf of Mexico to the Lakes and the River of St. Lawrence.

On July 27th, 1886, the first specimens of puparia, as Miss Ormerod informs us in her pamphlet, were sent to her from Hertford, from barley-fields cultivated by Mr. G. E. Palmer. In Essex the puparia appeared on wheat, the case showing the striations that would seem to adapt it to the culms, even more conspicuously. I am especially indebted to Mr. D. Taylor, jun., of Daleally Farm, Errol, near Perth, who has most kindly sent me the puparia on three several occasions during the spring months, and has thus enabled me to hatch the tenants. I have

reared from this bountiful supply about twenty specimens of the gnat, both males and females. Two of these were sent alive to Dr. Meade, of Bradford, to examine, and I append below the results of his careful and closely observed diagnosis. My first Cecid, a male, appeared on May 29th; the 30th yielded me two females, and the imagines have continued to emerge sparingly ever since, mostly every other morning. *C. destructor* is a great lover of moisture, and I would suggest to all who seek to rear it, that the glass-topped boxes should be well sprinkled with water, and that Hypnum-moss should be introduced therein. We thus assimilate Nature, that never errs in her ways and means, and recall, it may be, the dew-clad culms and herbage of the corn-plant. There are two broods in the year; the second brood, we are told, appears in August or early in September. Each female would seem to lay fifty eggs or more on the young winter or spring wheat.

PETER INCHBALD.

Fulwith Grange, Harrogate, June, 1887.

### CECIDOMYIA DESTRUCTOR, Say. The Hessian Fly.

This fly has been so often described that it seems almost superfluous to go over the same ground again; but my excuse must be that no complete scientific diagnosis has hitherto been published in any *British* entomological work; and as the gnat has found its way into this country, and may exercise great influence in the agricultural world, a technical account taken from *living* specimens, which will enable the fly to be recognised by entomologists, may not be without its value.

#### *C. destructor*, Say.

Thorax niger. Abdomen carnosum, feminâ maculis nigris quadratis disjunctis, mare confluentibus, signatum. Antennæ 17-articulatæ, mare petiolatæ, feminâ sessiles. Epistoma cirro nigro instructo. Pedes testacei nigro-lirti. Alæ nigrescentes, radicibus rufis. Long. mas. 2, fem. 3 mm.

FEMALE.—The female being the larger, more abundant, and more characteristic sex, I shall first describe it, and then mention the distinctive points of the male.

*Head.* Eyes, with forehead and occiput, black, the last clothed with thick and strong black hairs. Epistome prominent, and furnished with a tuft of black hairs. Palpi yellow, the four joints

being partly covered with black scales, which are more numerous on the second than on the first and third divisions, and entirely cover the terminal joint. Proboscis very small, and of a pink colour. Antennæ rather more than a third of the length of the body, yellowish brown, consisting of seventeen joints shortly verticillated with black hairs. The two basal joints are nearly twice as thick as the others; the first is club- or rather cup-shaped; the second nearly globular; the next are all smooth and cylindrical (turning irregular in size and shape when dry), about twice as long as broad, becoming gradually rather smaller towards the end, and terminating in an elongated tapering joint, which is about half as long again as the one before it. Collar or neck pinkish yellow.

*Thorax* black, with grey reflections, having a few scattered white hairs on the sides, and two indistinct lines of thinly placed white hairs along the dorso-central region.\* A pinkish red irregular-shaped streak or patch runs from the side of the neck along the lower side of the thorax to the base of the wing. *Scutellum* black, prominent, and crested with black hairs. *Halteres* pale red, irregularly clothed with patches of black scales.

*Abdomen* pinkish or yellowish brown, with eight segments; the first is nearly black; all the others are marked on each side of the dorsum with a large square velvet-black spot, which spots are separated by a considerable longitudinal space from those on the opposite side on all the intermediate segments, but become nearly confluent on the seventh and eighth joints.† A single row of similar large square spots runs down the centre of the ventral surface. The oviduct consists of three joints; the basal one is thick and rounded, the second and third are cylindrical, the last one being of about half the diameter of the second, pointed, and without lamellæ. They are all pale red, the terminal one being brown at the tip.

*Legs* pink, becoming brownish yellow after death, clothed irregularly with black scale-like hairs, which are generally thicker in the neighbourhood of the joints. The coxæ are brown, the short fore femora or trochanters black, the others yellowish brown.

\* See Osten-Sacken's Essay on Comparative Chaetotaxy.

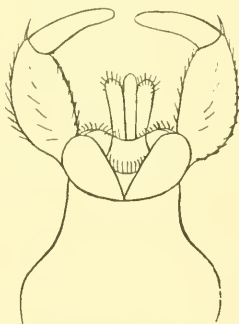
† Miss Ormerod, in her excellent paper upon the Hessian Fly, has described a small V-shaped mark on the back of the seventh and eighth segments. I was not so fortunate as to see it in the specimen which I examined.

The ends of the tarsi and fore tibiæ are generally darker than the other parts.

*Wings* pink at the roots, and clothed with black hairs; the second longitudinal vein runs nearly straight until near its extremity, when it curves slightly down and reaches the border of the wing a little above (or before) the apex. The third longitudinal vein gives off its descending branch in the usual way, which reaches the hind margin of the wing at a point exactly opposite the termination of the first longitudinal vein.

**MALE.** — The male insect differs from the female by being about one-third shorter, and much more slender. The antennæ have the same number of joints (seventeen), are pedunculated, and proportionally longer, being about two-thirds of the length of the body. The joints are ovoid in shape, becoming nearly globular towards the end. The terminal joint is not longer than the others, as in the female. The stalks are about half as long as the joints. The verticellar bristles are much longer than those in the female, and white in colour. The tuft of hairs on the end of the scutellum is also white.

The *abdomen* is almost black, with a pink extremity, but is really marked in the same way as the female, with large square black spots, only being very slender they coalesce; thus the two lateral rows cover the dorsum, only leaving a narrow pink line



Male genital organs from above.

down the centre, which is sometimes indistinct, and a pale streak across the edge of each segment. The spots on the ventral aspect hide the underlying colour altogether. The last joint of the abdomen is of a pale pink colour, and is provided with a pair of claspers or forceps of a brown colour, between which are seated

the generative organs, the peculiar structure of which is now found to be of great importance in the determination of nearly allied species among various insects, but which it is very difficult to describe without the aid of figures. Two thick blunt processes, which project forwards, are placed between the roots of the forceps, each of which has a small rounded eminence on its extremity. Beneath and behind these, occupying a central position, is an elongated tapering organ extending nearly to the joints of the claws of the claspers, which is flanked on each side by a flattened hairy process with a dilated extremity. These organs are of a pink colour.

The *legs* are rather paler than those of the female; the fore coxæ are pink.

The *wings* are proportionably longer than in the female, and less nigrescent. Mr. Inchbald tells me that when they are first expanded, "a ruddy tinge is observable throughout the wing." This is less conspicuous in the female.

R. H. MEADE.

1, Mount Royd, Bradford, June 15, 1887.

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R.H. Meade

1892.

Annotated List of  
British Rodinidae



# ANNOTATED LIST OF BRITISH TACHINIIDÆ.

BY R. H. MEADE.

The British *Tachiniidæ* are very little known, comparatively few species having been properly identified, or described, in any English work; and the Family has excited little interest among British Dipterists. For the purpose of drawing attention to them, and to facilitate their study, I shall endeavour to arrange them into genera, and to name and briefly define as many species as I have been able to find or identify. The list, I fear, will be very imperfect, but it can be filled up by others. I shall only include those species which may be called true Tachinids, and are comprised in the sub-family of *Tachininae* of Mr. Verrall's list.

These flies, which are parasitical upon other insects, especially upon *Lepidoptera*, belong to the most highly developed group of the *Muscidæ*, having strong wings, large scales (*alulets*), and often wide oval bodies.

The general characters of the family are the following:—The species are mostly armed with numerous strong spines and bristles. The eyes are more or less widely separated in both sexes, those of the male, however, being usually nearer together than those of the female. The frontal space (*frontalia*) is bordered with strong bristles (*fronto-orbital*), which are generally arranged in a single row on each side in the males, and in a double row in the females. The arista is mostly bare, with the basal half more or less thickened; it is composed of three joints, of which the first two are generally very short, and the third very long; but sometimes the second is more or less elongated, and becomes in some instances nearly or quite as long as the third. The antennæ vary much in length; the first joint is usually very short, the second is sometimes (in one genus only) longer than the third, occasionally of equal length with it, but generally much shorter. The sides of the *epistome* are usually furnished with long and strong vibrissæ, and the *facialia* (edges of the facial space containing the antennæ) are often ciliated for a longer or shorter part of their length. The cheeks (*wangen*, Sch., *mediana*, Dsv., the spaces between the *facialia* and the eyes) are sometimes clothed with soft hairs or bristles, and the chin (*backen*, Sch., *lateralia*, Dsv., the bottom of the face below the cheek and eyes) is also often ciliated. The back and sides of the thorax are furnished with rows of numerous spines, and the abdominal segments are also usually armed with strong setæ on their posterior edges, as well as in some species in the middle or disc. The

legs are also provided with numerous spines, which are arranged in different manners. The wings have the first posterior cell more or less closely contracted and sometimes closed at the end, where it joins the costa, by the apical cross vein, which is formed by the bending upwards of the fourth longitudinal vein.

It is chiefly by variation in the above characters that the genera and species are distinguished from each other; and the formation of genera has been found so difficult, owing to the impossibility of deciding between generic and specific characters, that some authors have given up generic division of the Family altogether. This, however, has been found so inconvenient, that some artificial arrangement, with the adoption of generic names, is absolutely necessary. I have, therefore, drawn up an analytical table of genera, taking the characters from Macquart, Schiner, Rondani, and others, which I will insert before commencing the diagnosis of species.

#### TABLE OF GENERA.

- 1 (70) First posterior wing cell open at the end.\*
- 2 (23) Arista with the second joint elongated.
- 3 (12) Arista straight; the second joint much shorter than the third.
- 4 (11) Antennæ with the second joint elongated.
- 5 (6) Antennæ with the second joint longer than the third
  1. ECHINOMYIA, Dumér.
- 6 (5) Antennæ with the second joint shorter than the third.
- 7 (8) Palpi rudimentary.....2. MICROPALPUS, Meq.
- 8 (7) Palpi normal.
- 9 (10) Proboscis very long, straight, and slender.....3. APHRIA, Dsv.
- 10 (9) Proboscis rather long, but thick; fronto-orbital bristles in a double row in both sexes .....4. DEMOTICUS, Meq.
- 11 (4) Antennæ with the second joint short.
- 12 (3) Arista geniculated; the second joint nearly or quite as long as the third.
- 13 (16) Head wide and swollen.
- 14 (15) Checks tumid, facial angle nearly straight.....5. GONIA, Mgn.
- 15 (14) Checks not tumid, facial angle inclined backwards...6. GERMARIA, Dsv.
- 16 (13) Head neither wide nor swollen.
- 17 (18) Proboscis long, slender, and twice elbowed .....7. SIPHONA, Mgn.
- 18 (17) Proboscis of the ordinary shape.
- 19 Wing-veins setigerous.
- 20 (21) Fourth longitudinal vein bent in a curve to form the apical cross vein; abdominal segments without discal setæ .....8. THRYPTOCERA, Meq.
- 21 (20) Fourth longitudinal vein bent at an angle; abdominal segments with discal setæ .....9. BIGONICHETA, Rnd.

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\* In some genera the aperture in certain species is very small, or even quite closed.



- 22 Apical cross vein deficient ..... 10. *ACTIA*, Dsv.
- 23 (2) Arista with the second joint short.\*
- 24 (65) Facial edges (*facialia*) unarmed, or ciliated only along their lower part.
- 25 (26) External (*discal*) cross vein extremely oblique ..... 11. *PLAGIA*, Mgn.
- 26 (25) External cross vein straight or only moderately oblique.
- 27 (46) Eyes hairy.
- 28 (43) Third joint of the antennæ not more than twice the length of the second, and often less.
- 29 (30) Colour bright gold-green ..... 12. *GYMNOCHETA*, Dsv.
- 30 (29) Colour generally black or grey.†
- 31 (34) Eyes of the male subcontiguous.
- 32 (33) Arista pubescent ..... 13. *MACQUARTIA*, Dsv. *h. n.*
- 33 (32) Arista bare ... ..... 14. *POLIDEA*, Mcq.
- 34 (31) Eyes of the male more or less widely separated.
- 35 (40) Abdomen wide and oval.
- 36 (37) Eyes much shorter than the face ... ..... 15. *NEMOREA*, Dsv.
- 37 (36) Eyes prolonged to near the bottom of the face.
- 38 (39) Cheeks hairy; abdominal segments without discal setæ ..  
16. *CHETOLIGA*, Rnd.
- 39 (38) Cheeks bare; abdominal segments with setæ on the disc ..  
17. *NEMORILLA*, Rnd.
- 40 (35) Abdomen oblong.
- 41 (42) Colour grey and red ... ..... 18. *OLIVIERIA*, Dsv.
- 42 (41) Colour shining black without red ..... 19. *ZOPHIOMYIA*, Mcq.
- 43 (28) Third joint of the antennæ always twice (or more than twice) the length of the second.
- 44 (45) Third joint of antennæ very convex in front... 20. *EPICAMPOCERA*, Mcq.
- 45 (44) Third joint of antennæ nearly straight in front..... 21. *EXORISTA*, Mgn.
- 46 (27) Eyes bare.
- 47 (58) Third joint of the antennæ not more (and often less) than twice the length of the second.
- 48 (49) Second joint of antennæ somewhat prolonged ..... 22. *TACHINA*, F.
- 49 (48) Second joint of antennæ not prolonged.
- 50 (51) Forehead prominent; arista pubescent at the base, cheeks ciliated  
23. *BRACHYCOMA*, Dsv. *h. n.*
- 51(50)(52) Head wide and swollen, arista and cheeks bare ..  
24. *MILTOGRAMMA*, Mgn.
- 52 (51) Head neither wide nor swollen.
- 53 (54) Antennæ with the third joint short and round ..... 25. *TRIXA*, Mgn.
- 54 (53) Antennæ with the third joint oblong.
- 55(56)(57) Abdomen subglobose ..... 26. *CLYTIA*, Dsv.
- 56(55)(57) Abdomen rather flattened ..... 27. *MACRONYCHIA*, Rnd.
- 57(55)(56) Abdomen slender and oblong ..... 28. *MYOBIA*, Dsv.

\* In some species it is slightly prolonged, in others it can scarcely be distinguished from the first joint.

† In some species the colour may be metallic-blue or aeneous, but never bright green.

- 58 (47) Third joint of antennæ always more than twice the length of the second.
- 59 (60) Apical cross vein deficient ..... 29. RÆSELIA, Dsv.
- 60 (59) Apical cross vein present.
- 61 (62) Abdomen conical and mostly spotted ..... 30. MEIGENIA, Dsv.\*
- 62(61)(63) Abdomen oval and not spotted... ..... 31. MASICERA, Meq.
- 63(64)(61) Abdomen oblong and narrow, colour black ... 32. HYPOSTENA, Mgn.
- 64 (63) Colour ochraceous ..... 33. LESKIA, Dsv.
- 65 (24) Facialia ciliated along their whole, or nearly their whole, length.
- 66 (69) Eyes bare.
- 67 (68) Forehead glistening white ..... 34. METOPIA, Mgn. *new sp.*
- 68 (67) Forehead not glistening white.
- 69 (72) Fourth longitudinal vein bent at an angle.
- 70 (71) Head somewhat vesicular and swollen ... . 35. FRONTINA, Mgn.
- 71 (70) Head not swollen ..... 35A. DESVOIDIA, Meade. *n. sp.*
- 72 (69) Fourth vein bent in a curve ... . 35B. DEOEERIA, Mgn.
- 73 (66) Eyes hairy ..... 36. PHOROCERA, Dsv.
- 74 (1) First posterior wing cell closed at (or before) the end (stalked or unstalked).
- 75 (78) Facialia ciliated.
- 76 (77) Wing cell closed at the end (unstalked) ..... 37. BAUMHAUERIA, Mgn.
- 77 (76) Wing cell stalked..... 40A. BRACHYCELIA, Meade.
- 78 (75) Facialia bare.
- 78 (89) Eyes bare.
- 79 (84) Cheeks ciliated with a row of bristles.
- 80 (83) Genal bristles continuous with the fronto-orbital ones.
- 81 (82) Antennæ long, and genal bristles large..... 40. SCOPOLIA, Dsv.
- 82 (81) Antennæ short, and genal bristles small ..... 38. CLISTA, Mgn.
- 83 (80) Genal bristles not continuous with the fronto-orbital ones ..  
..... 39. RHINOPHORA, Dsv.
- 84 (79) Cheeks bare, or with only a few scattered hairs.
- 85 (88) Alulæ of small or moderate size.
- 86 (87) Outer cross vein nearer to the inner one than to the bend of the fourth  
vein ..... 41. PLESINA, Mgn.
- 87 (86) Outer cross vein nearer to the bend of the fourth than to the inner cross  
vein ..... 43. PHYTO, Dsv.
- 88 (85) Alulæ very large ..... 42. LEUCOSTOMA, Mgn.
- 89 (78) Eyes hairy.
- 90 (91) First posterior wing cell unstalked ... . 44. TRYPIERA, Mgn.
- 91 (90) Wing cell stalked .. ..... 45. LÖWIA, Egg.

# 1.—ECHINOMYIA, Duméril.

*Servilia*, pt., Dsv.

*Fabricia*, pt., Dsv.

*Gen. ch.*—Eyes bare; facialia unarmed; epistome prominent; antennæ long and drooping, with the third joint wide, and shorter than the narrow prolonged second joint; arista bare, with both the

\* Some species in this genus have the eyes hairy.

first and second joints somewhat elongated, the first being, however, much shorter than the second, which again is three or four times shorter than the third ; body large, with a wide oval abdomen, furnished with numerous hairs and bristles ; fore tarsi dilated in the female, in which sex the frontalia are wider than in the male, and have a double instead of a single row of *fronto-orbital* setæ on each side.

- 1 (8) Abdomen armed with bristles, but not clothed with soft hair.
- 2 (7) Palpi filiform.
- 3 (4) Abdomen subglobose and black ..... 1. *grossa*, L.
- 4 (3) Abdomen oval and ferruginous.
- 5 (6) Antennæ rufous ..... 2. *fera*, L.
- 6 (5) Antennæ nigrescent ..... 3. *tessellata*, F.
- 7 (2) Palpi clavate (*fabricia*, Dsv.) ..... 4. *ferox*, Pz.
- 8 (1) Abdomen clothed with soft hairs as well as armed with bristles (*servillia*, Dsv.).
- 9 (10) Abdomen with the sides red ..... 5. *lurida*, F.
- 10 (9) Abdomen with the sides not red ..... 6. *ursina*, Mgn.

### E. GROSSA, L.

This handsome fly, the largest of the British Muscids, has the thorax, abdomen and legs black. The face is yellow, and the cheeks, chin and all the back of the head are clothed with yellow hairs. The first and second joints of the antennæ are rufous, the third is black, rather small, and not quite half so long as the second. It is not common, and has been bred from cocoons of *Bombyx trifolii*.

### E. FERA, L.

This species varies a good deal, but it is characterized by the thorax being black, with testaceous shoulders and sides ; by the abdomen being yellow and pellucid, marked with a wide, longitudinal, dorsal black stripe ; by the face being yellow, and the head clothed with yellow hairs ; by the antennæ having the first two joints rufous, and the third black, which is about half the length of the second ; by the legs (including the tarsi) being wholly yellow in the female, but having the basal halves of the femora black in the male. This is the most common species in the genus, and has been bred from the cocoons of several moths.

### E. TESSELLATA, F.

This species differs from *E. fera* by having the dorsal stripe on the abdomen narrower, and sometimes interrupted ; by the thorax being grey rather than black, with the front and sides pale, and with indistinct dorsal stripes ; by the face being white, and the hairs on the occiput, &c., pale yellow ; by the legs being black or piceous ; and the antennæ black or grey, with the second joint rufous at its extremity. The third joint is wide and large, and only about one-third shorter than the second. This species is rare.

### E. FEROX, Panz.

This species is very similar in form and colour to the last. Its characteristic

feature is the dilatation of the ends of the palpi, which are thick and clavate. The thorax and legs are black; the abdomen is rufous, with a wide sinuous (sometimes interrupted) dorsal black stripe, which is dilated, and covers the end of the last segment. The antennæ are black and rather short, the last joint being about two-thirds of the length of the second. This is also rare.

### E. LURIDA, F.

In this and the following species the whole body is clothed with soft hairs, in addition to spines and bristles; the frontalia are also furnished with numerous soft hairs besides the ordinary bristles, which are weaker than usual, and very irregularly arranged; the hairs also extend down to the cheeks. In *E. lurida* the clothing on the abdomen is bright golden-yellow, beneath which the skin is black and shining; the sides of the abdomen are more or less widely marked with red. The antennæ have the first two joints piceous or testaceous, and the third (which is very little shorter than the second) black. The legs are testaceous, the femora being more or less nigrescent. This species is not common. I received one some years ago from Mr. Dale, captured, I believe, in Dorsetshire; it has been bred from the pupæ of *Cucullia verbasci*.

### E. URSINA, Mgn.

This is larger than the former, being 6 lines (about 12 mm.) in length. It resembles *E. lurida* in general characters, but differs by having the abdomen almost entirely black, it being only slightly testaceous on the sides of the basal segments; the hairs on the abdomen are also less yellow, but whitish, and mixed with black; the cheeks have also more black hairs upon them than in *E. lurida*, in which they are mostly pale yellow, though mixed with black bristles; the antennæ also have the second joint rather longer than in *E. lurida*. This species is rare.

## 2.—MICROPALPUS, Mcq.

*Gen. ch.*—Body oblong; eyes hairy; antennæ drooping, with the second joint narrow, elongated, and generally only a little shorter than the third, which is widened and truncated at the end; arista with the second joint more or less elongated, but always four or five times shorter than the third; proboscis rather long and projecting, dilated at the end; palpi very small and short (quite rudimentary), and terminating in a little bristle; wings with a cubital appendix. The female has the frontalia wider than in the male, and armed with a double row of fronto-orbital bristles,\* and also has the fore tarsal joints dilated as in the genus *Echinomyia*. The flies in this genus resemble those in the former one in their general habit, but are smaller and feebler in organization.

- |   |     |                      |                                 |
|---|-----|----------------------|---------------------------------|
| 1 | (2) | Legs rufescent ..... | 1. <i>vulpinus</i> , Fln.       |
| 2 | (1) | Legs nigrescent.     |                                 |
| 3 | (4) | Chin bare .....      | 2. <i>fulgens</i> , Mgn.        |
| 4 | (3) | Chin hairy .....     | 3. <i>hæmorrhoidalis</i> , Fln. |

\* As these bristles are usually in a single row in the male, and in a double row in the female, I shall only mention them again when they depart from this rule.

*M. VULPINUS*, Fln.

Thorax black, covered with white tomentum, and marked with four longitudinal black stripes; shoulders and sides yellow; scutellum yellow; abdomen rufous, with a wide longitudinal black dorsal stripe, which does not reach the apex, and with white tessellations, assuming the form of irregular broken transverse bands on the sides; cheeks bare; chin with a few soft hairs, but no bristles; legs testaceous, with the knees and tarsi nigrescent. Not rare; has been bred by Mr. F. Norgate from *Sphecia bembeciformis*.

*M. FULGENS*, Mgn.

This species differs from the former by having the chin quite bare; the legs nearly black; and the abdomen with the dorsal black stripe rather indistinct; so that it appears to be tessellated or variegated all over with red and white patches. Rare.

*M. HEMORRHOIDALIS*, Fln.

This may be distinguished from both the other species by the chin being furnished with both hairs and bristles; by the antennæ having the second joint only half the length of the third; by the abdomen being black with red sides, and white tessellation, as well as having the anal segments red in both sexes; and by the legs being black, with the tibiæ partly testaceous. This species has not yet been recorded as British, but I possess one specimen which I obtained many years ago from the late Mr. F. Walker, with other British flies, and it is so common in Germany and Scandinavia that I think it may be safely recorded as indigenous.

3.—*APHRIA*, Desv.

*Gen. ch.*—Eyes bare; face rather oblique; facialia unarmed; antennæ drooping, second joint rather long, only a little shorter than the third joint in the male, and subequal with it in the female; arista with the second joint elongated, it being about one-fifth of the length of the third; proboscis long, narrow, pointed, and projecting horizontally forwards; fourth longitudinal vein bent upwards in a curve; third longitudinal vein setigerous.

*A. LONGIROSTRIS*, Mgn.

This (the only British species) is whitish-grey; the thorax is marked by four fine longitudinal black lines; the scutellum is grey; the abdomen is also cinereous, with the first segment black, and having a black band on the posterior edges of the other segments; the second and third and sometimes the base of the fourth rings are rufous on the sides; the frontalia and palpi are testaceous, the latter having black tips in the male, according to Macquart. This rare Tachinid is in Mr. C. W. Dale's collection.

4.—*DEMOTICUS*, Meq.

*Gen. ch.*—Eyes bare; frontalia wide, and armed with a double row of orbito-frontal bristles in both sexes;\* facialia unarmed; cheeks and chin bare; antennæ reaching the epistome, which is somewhat

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\* This only applies to the first and typical species.

prominent ; second antennal joint a little elongated, but two or three times shorter than the third ; arista with the second joint more or less prolonged ; wings with the veins setigerous.

- 1 (2) Arista with the second joint a good deal elongated ; third longitudinal vein armed with bristles at the base .....1. *plebejus*, Fln.
- 2 (1) Arista with the second joint very little prolonged ; second, third, and fourth longitudinal veins all setigerous .....2. *frontatus*, Bohem.

#### D. PLEBEJUS, Fln.

Thorax light bluish-grey, with four indistinct black stripes, the central ones very narrow ; scutellum grey ; abdomen cinereous, with a broad irregular black band on the posterior margin of each segment ; the second and third segments mostly red on the sides ; orbito-frontal bristles in a double row in both sexes ; antennæ black or brown ; arista with the second joint about one-fourth of the length of the third ; palpi red ; wings with the third longitudinal vein armed with a few setæ near the base ; legs black, with tibiæ piceous. This rare species was captured by Mr. C. W. Dale, at Freshwater, I. of W., in June, 1880.

#### D. FRONTATUS, Bohem.

This species resembles the former in general form and colour, being only of rather a more yellow-grey ; it differs, however, by having the eyes much nearer together in the male than in the female, and by the frontalia having only a single row of bristles on each side in the former sex ; the two first joints of the antennæ are also testaceous, and the arista has the second joint very short, and the third thickened along its basal third ; the palpi are black ; the proboscis is much longer than in *D. plebejus*, also narrow, pointed, and projecting forwards ; the abdomen is rather lighter in colour than in *D. plebejus*, marked by irregular black bands and reflections, and has the sides of the segments red and translucent ; the wings have the first (auxillary branch), third, and fifth veins setigerous ; and the tibiæ are darker in colour than in *D. plebejus*. This species, which is not uncommon, is quite aberrant, and might be placed in the genus *Aphria* as well as in *Demoticus*, the proboscis being narrow and somewhat elongated, and the fronto-orbital bristles in a single row only in the male. Zetterstedt and Boheman seem only to have known the female, and Schiner does not allude to any difference between the sexes. I have captured this fly in different parts of England.

#### 5.—GONIA, Mgn.

*Gen. ch.*—Body ovato-oblong ; head very wide and tumid ; eyes bare, small, and very widely separated, in both sexes ; frontalia broad and ciliated, with a number of rather fine bristles arranged irregularly in several rows in both male and female ; cheeks and mentum swollen, and more or less hairy ; antennæ long and narrow, with the third joint much longer than the second, especially in the male ; arista bent upwards in the middle, and having the second joint much elongated, it being in some species rather longer, and in others rather shorter,



than the third; abdomen without setæ on the disc or middle of the segments; feet with the claws and pads (pulvilli) very small; the males are rather difficult to discriminate from the females.

- 1 (2) (3) Abdomen quite black ..... 1. *Försteri*, Mgn.
- 2 (1) (3) Abdomen black, with narrow white bands ... 2. *fasciata*, Mgn.
- 3 (1) (2) Abdomen red, with a dorsal black stripe.
- 4 (5) Face dull, without glittering reflections ... 3. *divisa*, Mgn.
- 5 (4) Face with white or yellow glittering reflections.
- 6 (9) Abdominal dorsal stripe narrow.
- 7 (8) Fourth abdominal segment black ..... 4. *capitata*, De Geer.
- 8 (7) Fourth segment red ..... 5. *trifaria*, Zeller.
- 9 (6) Abdominal dorsal stripe wide.
- 10 (11) Fourth abdominal segment only black ... 6. *lateralis*, Zeller.
- 11 (10) Third and fourth segments black ..... 7. *ornata*, Mgn.

### G. FÖRSTERI, Mgn.

This fine species, usually the largest in the genus, has the head reddish-yellow, with silvery reflections; the antennæ have the basal joints testaceous, and the third black or grey; the second joint of the arista is a little curved and rather longer than the third; the palpi are yellow; the cheeks and chin are almost bare; the thorax is rusty-black, and indistinctly striped; the scutellum is brownish-yellow; the abdomen is shining blue-black, without any white bands or reflections; the legs are black, or nearly black, in this, as well as in all the other species in the genus. Rare.

### G. FASCIATA, Mgn.

*ruficeps*, Wlk.

This species is very similar to *G. Försteri*, but is usually smaller, and has the shining black abdomen marked with narrow white bands on the front edges of the segments; the thorax is also rather more distinctly striped, and the cheeks are more hairy. Not common.

### G. DIVISA, Mgn.

This species differs from all the others by having the frontalia and cheeks of rather a dull yellow colour, without gloss or glitter; the cheeks are thickly covered with hair, the abdomen is of a transparent red colour, marked with a broad, dorsal, black, longitudinal stripe, and with very narrow transverse white bands, which are often indistinct. Rare.

### G. CAPITATA, De Geer, Zett., Rnd., non Mgn.

Three distinct species have been mixed together under this name, viz.: *G. capitata*, *G. lateralis*, and *G. ornata*, so it is rather difficult to determine which is the one named by De Geer; upon reference, however, to his figure of this fly, I find that it gives (though rude) a very characteristic delineation of a female specimen, as described by Zetterstedt and Rondani; therefore, I shall adopt their diagnosis. Head, with frontalia, rather wider in the female than in the male; face glistening with yellowish-white reflections; cheeks nearly bare; antennæ with the basal joints testaceous, the third joints black or grey, and about four times the length of the second in the male, and only about twice in the female; arista with the second joint

rather shorter than the third; thorax much the same as in *G. Försteri*; abdomen reddish-yellow, with a black longitudinal dorsal stripe, narrow in both sexes over the two first segments, being not wider than the space between the two central setæ on the edge of the second segment. In the male it continues of the same width to near the bottom of the third ring, where it spreads out and covers the fourth segment. In the female (whose abdomen is shorter and rounder) the black stripe is dilated, and covers the middle of the dorsum of the third segment, as well as the fourth segment, leaving the sides of the third, and a little of those of the fourth, however, always red. The bases of the third and fourth segments are encircled by a wide white band, and the base of the second also by a narrow one. Not common.

### G. TRIFARIA, Zeller.

The males of this species very closely resemble those of *G. capitata*, but differ in the following particulars. The abdomen is more translucent, and the narrow longitudinal black band extends of the same width to the apex, leaving the fourth segment red on the sides like the others; the circular white bands are also very narrow on the edges of both the second and third segments, but form a wide white patch on the sides of the fourth. I do not know the female of this species. In Miss Prescott Decie's collection, and also in that of Mr. Billups, the latter specimen was captured at Dulwich.

### G. LATERALIS, Zeller, Zett., Rnd.

This species differs from *G. capitata* by having the abdominal stripe twice as wide, and not straight on the sides; it is dilated at the top over the first segment, and a little again on each side opposite the junction of the second and third segments, finally spreading out and covering the whole of the last; the sides of the third segment are entirely red, as in *G. capitata*, which this species closely resembles, except by the width and shape of the abdominal stripe, and, as pointed out by Rondani, by the middle setæ on the border of the third segment of the abdomen being placed a little more forward than the others in the same row, so that they are placed on the disc, and not on the edge. This is not an uncommon species, I have received several from Mr. Bridgman, captured in Norfolk, and Mr. Bignell sent me one some years ago, which he had bred from a Lepidopteron.

### G. ORNATA, Mgn.

This species differs from *G. lateralis*, by having the thorax usually more distinctly striped by four black bands, and having the abdominal dorsal broad stripe still wider (in the male), straight on the sides, and only continued to the base of the third segment, when it expands and covers the whole of that ring (except a small patch on the side), as well as all the fourth segment. The white transverse fascia is rather wider upon the fourth segment than upon either of the others, but that upon the second is the narrowest. Not rare, I have received specimens from Mr. C. W. Dale, and also from Mr. Bridgman.

## 6.—GERMARIA, Dsv.

*Gen. ch.*—This genus is closely allied to *Gonia*, and the single species which it contains has generally been included in it; the chief points of difference between them are that in *Germaria* there is less tumidity of the cheeks, which are also less setose; there is greater obliquity of the facial angle; the facialia are ciliated along the lower part of their edges; and the fronto-orbital bristles are stronger, and extend lower down.

## G. RUFICEPS, Fln.

This fly is black, covered with slate-grey tomentum; the palpi are yellow; the antennæ have the first two joints rufous, and the third black; the arista has the second and third joints of nearly equal lengths; the thorax has four black lines; the abdomen is oblong, with the second, third, and fourth segments encircled with a broad whitish band, and has no discal setæ; the wings are armed with a number of small spines at the bases of the first and third veins, and there is a short cubital appendix. Rare; it is figured in Curtis's British Entomology.

## 7.—SIPHONA, Mgn.

*Gen. ch.*—The little grey flies contained in this genus are characterized by having a long, filiform, horny proboscis, which is twice bent or elbowed; and also by the arista being bent towards the middle, at the junction of the second and third joints, the former of which is a good deal elongated, being more than half as long as the latter; the eyes are bare; the orbito-frontal bristles are in a double row (on each side) in both sexes; the antennæ are rather long, the third joint being two or three times the length of the second; the abdomen has all the rings of nearly equal width, and without setæ on the disc; the wings have the apical cross veins rounded at the base, and the first posterior cell terminating near the apex of the wing.

The frontalia are nearly of equal width in both sexes, and the orbito-frontal bristles being always in a double row, it is difficult at first sight to distinguish the males from the females, owing to which causes they have been separated, and described as distinct species; they may, however, be known from each other by the following characters: the third joint of the antennæ is about three times the length of the second in the males, and only about twice as long in the females; the abdomen is rather narrow and subcylindrical in the males, and thickened at the apex, in the females it is rather wider and flatter,

and pointed at the end; the colour of the two sexes is also different, of the males being more or less testaceous, and that of the females cinereous.

1. First abdominal segment armed with setæ on the margin... 1. *geniculata*, De Geer.
2. First abdominal segment without setæ ..... 2. *cristata*, F.

### S. GENICULATA, De Geer.

*flavifrons*, Stæg., Schn., ♂.

Antennæ with the first two joints rufous, and the third black or grey; palpi yellow; thorax grey, unstriped, clothed with rows of black bristles and numerous short black hairs; scutellum grey, with apex often yellow; abdomen in the male yellowish-grey, often testaceous at the base and sides, with the apex and a longitudinal dorsal stripe grey; in the female it is entirely grey upon the dorsum, but sometimes a little yellow underneath at the base; the anterior edges of each segment are encircled with a narrow pale ring in both sexes; and there are two setæ in the middle of each segment near the edge, besides others on the sides; the legs are yellow, with the exception of the tarsi. Very common.

### S. CRISTATA, F.

*tachinaria*, Mgn., ♂.

*cinerea*, Mgn., Rond., ♀.

This species, which may be at once known from the former by the absence of setæ on the middle of the edge of the first abdominal segment, has the male very similar to that of *S. geniculata*; the two basal joints of the antennæ are, however, sometimes partly nigrescent; the thorax is of rather a lighter grey, with pale shoulders, and the abdomen is more flavescent and translucent. The female, which seems to be less common than the male, is entirely of a pale bluish-grey colour, the under-surface of the abdomen only being a little lutescent; the femora are also partly grey. Mr. Bignell sent me three examples of the latter sex (the only ones that I have seen) in 1883, which were bred from *Leucania littoralis*.

### 8—THIRIPTOCERA, Meq.

*Gen. ch.*—The little black and grey flies in this genus have the eyes bare, and widely separated in both sexes; the orbito-frontal bristles in a double row in both males and females; facialia unarmed; cheeks bare; antennæ with both basal joints short, and the third from three to four times longer than the second; arista mostly bent or elbowed, with the second joint elongated, but shorter than the third; abdomen oval, with the segments nearly equal in width, and only armed with setæ on the posterior margins; wings with some of the veins mostly setigerous, apical cross vein usually curved at the base, outer cross vein seated midway between the inner one and the curve of the fourth longitudinal vein; and first posterior cell terminating near the apex of the wing.

The males and females closely resemble each other.

- |   |     |                                                 |                               |
|---|-----|-------------------------------------------------|-------------------------------|
| 1 | (4) | Wings with the alternate veins setigerous.      |                               |
| 2 | (3) | Antennæ nigrescent                              | 1. <i>crassicornis</i> , Mgn. |
| 3 | (2) | Antennæ rufous                                  | 2. <i>pilipennis</i> , Fln.   |
| 4 | (1) | Wings with the third long vein only setigerous. |                               |
| 5 | (6) | Legs testaceous                                 | 3. <i>bicolor</i> , Mgn.      |
| 6 | (5) | Legs nigrescent.                                |                               |
| 7 | (8) | Second joint of arista short                    | 4. <i>cognata</i> , Schn.     |
| 8 | (7) | Second joint of arista long                     | 5. <i>minutissima</i> , Zett. |

#### T. CRASSICORNIS, Mgn.

Antennæ black, with third joint long and thick, the basal joints are sometimes subrufous; palpi yellow; thorax grey and unstriped; scutellum grey; abdomen black, segments encircled on the front edges with a white ring or band, which is wider in the males than the females; legs nigrescent; wings with the first, third, and fifth veins setigerous. Not rare.

#### T. PILIPENNIS, Fln.

This species is very similar to the last, but has the antennæ smaller and rufous, the scutellum is also red at the apex, and the legs piceous; the wings have the bases yellow, and have the veins ciliated, as in *T. crassicornis*. Rare; Mr. Bignell sent me a specimen in 1882, which he had bred from a *Tortrix*.

#### T. BICOLOR, Mgn.

Antennæ rufous, third joint sometimes partly grey or black; palpi yellow; thorax grey and unstriped, with the shoulder points luteous; scutellum yellow; abdomen rufous, with a narrow pale band round the base of the segments; legs testaceous; wings with the third longitudinal vein only setigerous, the spines extending from the root of the vein to a little beyond the inner cross vein. Not rare; Mr. Bignell sent me several in 1882, bred from *Bombyx quercus*.

#### T. COGNATA, Schn.

This is rather an aberrant species, for the second joint of the arista is short and indistinct, like the first; the wings also have only three or four setæ at the base of the third long vein. In other points, however, it resembles the foregoing species; the antennæ have the third joint large, thick, and black, with the basal joints rufous; palpi yellow; thorax grey, with four narrow black stripes on the front; abdomen black, with the second and third rings encircled with a white band, legs black. Rare.

#### T. MINUTISSIMA, Ztt.

This little species, only two or three mm. in length, has the second joint of the arista much elongated, it being about two-thirds of the length of the third joint, with which it is geniculated; the antennæ have the third joint thickened; the palpi are rufous or piceous; the thorax is cinereous, with the shoulders pale, and the dorsum marked in front with two narrow stripes; the abdomen is black, with a narrow white band round the front margins of the segments; the legs are black; the wings have the apical cross veins pale and rather indistinct, bluntly angular at the base, and joining the costa exactly at the apex of the wing; the veins are



unarmed, except with one or two bristles at the base of the third vein. Rare; I have only seen two examples, which were found by the Rev. Mr. Bloomfield, at Guestling, near Hastings.

#### 9.—BIGONICHETA, Rnd.

*Gen. ch.*—This genus is closely allied to *Thriptocera*, but differs by having the eyes slightly pubescent; the arista twice elbowed, all three joints being of nearly equal length; the cheeks setigerous; the abdomen with setæ on the disc, as well as on the margin of the segments; the wings with the fourth longitudinal vein bent at an angle (not curved), and the outer cross vein placed nearer to the inner one than to the angle of the fourth longitudinal vein. Other characters as in *Thriptocera*.

#### B. SPINIPENNIS, Mgn.

Palpi red; antennæ black, with the third joint a little rufous at the base; cheeks ciliated with bristles, which extend quite to the bottom, but are not seated on the edges of the faecialia; thorax cinereous, marked with four longitudinal black lines, the inner pair being narrow and rather close together; abdomen grey, with a rather sinuous black band on the hinder part of each segment; legs black, with the coxæ tinged with red; wings with the first, third, and fifth longitudinal veins setigerous. Not common; Mr. Fletcher, of Worcester, sent me a specimen some years ago, which was bred from *Coccyx strobilella*; I captured one near Ulverstone, Lancashire, in 1886, and Mr. Billups sent me one for examination, which he had taken in his garden at Peckham. I believe that this species is only a variety of *B. setipennis*, Flm., as Meigen makes the chief difference to consist in the colour of the palpi, and many years ago I obtained two continental specimens from Herr Kowarz, captured at Asch, in Bohemia, which were named *B. setipennis*, and which had the ends of the palpi red.

#### 10.—ACTIA, Dsv.

This genus, like the last, is so closely allied to *Thriptocera*, that I think they should both be considered only as subgenera. As in the parent genus, the arista is bent and has the second joint a good deal elongated; the veins of the wings are also setigerous, and the form, size, and colour of the body are very similar to those of the *Thriptocerae*. The characteristic feature in *Actia* is the want of the apical cross vein in the wings, in which respect it resembles the genus *Ræselia*, Dsv., with which it was confused by Meigen, the *Thriptocera frontalis*, Mcq., being the same as *Ræselia Lamia*, Mgn.

#### A. FRONTALIS, Mcq.

Palpi piecons; antennæ black; thorax grey, and indistinctly striped; scutellum grey; abdomen shining black, with the front margins of the second, third, and fourth segments surrounded by a narrow white band, interrupted in the centre, so as to leave a longitudinal black stripe; legs nigrescent; wings with the first (auxiliary



branch), third, and fifth veins armed with bristles. I am not aware that this species has yet been found in Britain, but I have described it from continental specimens, so as to render the group of *Thriptoceratæ*, Desv., more complete.

#### 11.—PLAGIA, Mgn.

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June, 1891.

*Gen. ch.*—Middle-sized nigrescent species, with the outer cross veins of the wings extremely oblique. Eyes in some species hairy, in others bare; widely separated, and with a double row of *orbito-frontal* bristles on the frontalia in both sexes; antennæ with the second joint elongated, it being from one-half to two-thirds of the length of the third joint; arista with the second joint slightly prolonged; facialia unarmed; cheeks more or less deeply ciliated by a continuation of the orbito-frontal bristles, which in some species is prolonged quite to the epistome; wings with one or more of the veins setigerous, and with a cubital appendix; fore tarsi of the males with the last joint provided with long claws and bristles.

Rondani divides this genus or group (*Plagidæ*, Dsv.) into three subgenera, viz., *Cyrtophlæba*, *Blepharigena*, and *Plagia*, the first, which has the eyes hairy, and the cheeks ciliated quite to the epistome, may be looked upon as a well marked genus, but the distinctions between the other two are so slight as not to be worth notice; *Blepharigena* only differing from *Plagia* by having the cheeks rather more deeply ciliated, and the middle abdominal segments with discoidal setæ, which characters I find to be very variable.

- |   |     |                                          |                                   |
|---|-----|------------------------------------------|-----------------------------------|
| 1 | (2) | Eyes hairy ( <i>Cyrtophlæba</i> , Rnd.)  | .....1. <i>ruvicola</i> , Mgn.    |
| 2 | (1) | Eyes bare.                               |                                   |
| 3 | (4) | First and third veins setigerous.....    | 2. <i>ruralis</i> , Fln.          |
| 4 | (3) | Third vein only setigerous.              |                                   |
| 5 | (6) | Antennæ wholly black                     | .....3. <i>trepida</i> , Mgn.     |
| 6 | (5) | Antennæ with first two joints testaceous | .....4. <i>curvinervis</i> , Ztt. |

#### P. RURICOLA, Mgn.

Eyes hairy; palpi yellow; antennæ with the first two joints testaceous, and the third black, the second joint nearly as long as the third; cheeks ciliated quite to the epistome; thorax black, covered with light grey tomentum, and having four longitudinal stripes; abdomen black, with wide, irregular, grey, transverse fascia, expanded on the sides of the segments, no setæ on the middle of the second and third rings, but having the median marginal spines placed at some distance from the edge; legs black; wings with the third longitudinal vein ciliated from the base to the little cross vein; cubital appendix short. I have not seen a British specimen of this species, but Walker has included it among his *Tachinæ*, the description being, however, very vague.

#### P. RURALIS, Fln.

Eyes bare, palpi black with yellow ends; antennæ black, with the third joint

about one-third longer than the second; orbito-frontal bristles scarcely extending half way down the cheeks; thorax and abdomen similar to those in *P. ruricola*; legs black; wings with the outer cross veins sinuous, and less oblique than those in the other species, the first (auxillary branch) and third veins both spinigerous; cubital appendix short. Not uncommon.

#### *P. TREPIDA*, Mgn.

Eyes bare; palpi and antennæ black, the latter with the third joint about one and half times as long as the second; cheeks ciliated nearly to the bottom; thorax grey, with four black stripes, the central pair being narrow; abdomen black, with grey reflections, and armed on the central segments with both marginal and discal setæ; legs black; wings with the outer cross vein straight and very oblique, and with the third longitudinal ciliated from the base to a short distance beyond the little cross vein; cubital appendix rather long. Rare; I captured one specimen in 1876 near Bicester, Oxon.

#### *P. CURVINERVIS*, Ztt.

Eyes bare; palpi yellow; antennæ with the two basal joints testaceous, the third black, and fully twice as long as the second; cheeks ciliated about half way down; thorax grey, with four rather indistinct stripes; abdomen as in *P. trepida*, with white reflections, and spines both on the disc and edges of the segments; legs black; wings with the outer cross veins very oblique, and with the third vein ciliated along almost its whole length; cubital appendix short. Generally distributed, but not common; Mr. Billups sent me one, bred from *Pædisca sordidana*.

### 12.—GYMNOCHÆTA, Dsv.

*Gen. ch.*—The species in this genus are of a bright golden-green colour; the forehead and face are prominent; the eyes hairy and much nearer together in the males than in the females; the antennæ are drooping, with the second joint elongated and about two-thirds of the length of the third joint; the cheeks are bare, but the chin hairy; the abdomen is subglobose, and has both discal and marginal setæ; the wings have the fourth longitudinal vein bent at an acute angle, and the outer cross vein placed near to the angle.

#### *G. VIRIDIS*, Fln.

This, the only recorded British species, has the sides of the frontalia glossy green, the central stripe being rufous; the palpi and antennæ are black; the thorax and abdomen are of a brilliant green colour, with sometimes a coppery tinge; the legs are black, with the bases of the femora green; the wings have a yellowish-brown tinge, and the fourth longitudinal vein has a short cubital appendix. Not uncommon.

### 13.—MACQUARTIA, Dsv.

*Gen. ch.*—This genus contains a number of moderate or small sized species, with ovoid or oblong bodies, often of a bright metallic blue-black or bronze colour; the males have the eyes approximate or

contiguous, and hairy; in the females they are moderately separated, and often only pubescent; the antennæ are short, with a tomentose arista; the facialia are unarmed; the cheeks are bare, but the mentum or chin is hairy or bristly; the abdomen has both discal and apical setæ; the wings have the fourth longitudinal vein bent in a curve or blunt angle, and the first posterior cell opens near the apex of the wing. These flies are not common, and several species are difficult to determine, being very much alike.

- |    |      |                                          |                                |
|----|------|------------------------------------------|--------------------------------|
| 1  | (8)  | Colour bright metallic or blue-black.    |                                |
| 2  | (3)  | Palpi yellow.....                        | 1. <i>tenebricosa</i> , Mgn.   |
| 3  | (3)  | Palpi piceous or black.                  |                                |
| 4  | (7)  | Abdomen with white reflections.          |                                |
| 5  | (6)  | Colour blue-black ... ..                 | 2. <i>spinicincta</i> , sp. n. |
| 6  | (5)  | Colour bronze .....                      | 3. <i>nitida</i> , Ztt.        |
| 7  | (4)  | Abdomen without white reflections ... .. | 4. <i>chalybeata</i> , Mgn.    |
| 8  | (1)  | Colour dull black or grey.               |                                |
| 9  | (12) | Legs black.                              |                                |
| 10 | (11) | Palpi yellow.....                        | 5. <i>ciliaris</i> , Ztt.      |
| 11 | (10) | Palpi black ... ..                       | 6. <i>grisea</i> , Fln.        |
| 12 | (9)  | Legs partly or wholly yellow.....        | 7. <i>dispar</i> , Fln.        |

### M. TENEBRICOSA, Mgn.

Shining metallic-blue or bronze-black; eyes contiguous in the male, and separated by about a fourth of the width of the head in the female; frontal stripe rufous or piceous in the latter sex; fronto-orbital bristles only extending slightly below the base of the antennæ, which are black, and have the third joint about one and a half times the length of the second; arista thickly pubescent; palpi yellow; thorax grey upon the front and sides, and marked with four black stripes, the central pair being rather wide apart and narrow; there are four external dorso-central bristles behind the transverse groove; abdomen with very slight grey reflections; dorsal setæ weak, and seated upon both the disc and edges of segments; legs black; calyptæ brown in the male, and nearly white in the female; halteres yellow; wings brown in the male, and nearly clear in the female; apical cross vein slightly curved inwards, outer cross vein sinuous. Not common; I have found both sexes near Lake Windermere.

### M. SPINICINCTA, sp. n.

This, which is about the largest British species (length, 7—9 mm.), has the thorax wide and the abdomen oval; the colour is shiny blue-black, with white tomentum and reflections; the male has the forehead and face rather flat; the eyes approximate, the frontalia ciliated with very long, strong, and thickly set fronto-orbital bristles, which spread out upon the upper part of the cheeks and terminate in a large group or patch opposite the base of the third joint of the antennæ; margins of frontalia black, central stripe rufous or piceous; cheeks white, with black reflections; antennæ short, basal joints piceous, third joint about equal in length to the other two, and black; arista long and tapering, somewhat thickened at the base, and very shortly pubescent; epistome very slightly prominent, with long fibrissæ, and having a row of bristles extending backwards along the margins of the mouth

(peristome); chin rufous, clothed with soft hairs; palpi black or piceous; thorax marked upon the front margin with four widish black stripes, the central pair often divided by a narrow line; external dorso-central bristles, three behind the transverse groove; abdomen with white reflections on the sides, the first segment has two central marginal spines, the second segment has two central discal ones, and two marginal ones; the third is surrounded by two transverse rows of strong setæ, one running across the centre or disc, and the other on or near the edge; the fourth segment is armed with numerous spines; the legs are black; the wings have a brownish-yellow tinge, the apical cross vein is straight, with a blunt or rather rounded angle at the base; the outer cross vein is oblique and sinuous, the third longitudinal vein has several setæ at the base. This species, of which I do not know the female, is not uncommon; I formerly confounded it with the *M. cælebs* of Rondani.

#### *M. NITIDA*, Ztt.

This species is very similar to *M. tenebricosa*, but differs by having the palpi black or piceous, instead of yellow; the arista less pubescent; the middle thoracic stripes wider; the external dorso-central bristles three instead of four in number behind the groove; the abdomen more oblong, and with more white reflections on the sides. Rare; in Mr. Dale's collection.

#### *M. CHALYBEATA*, Mgn.

Glossy black or blue-black, without any white tomentum or reflections, with the exception of a little on the shoulders in the female; the eyes in the male are somewhat separated (subcontiguous); the palpi black; the posterior external dorso-central bristles three in number; the calyptra yellow; the halteres piceous; the wings nearly clear, with the apical cross vein nearly straight and curved at the base, and the third longitudinal vein bristly from the base nearly to the little cross vein. Not common; I have captured it in Oxfordshire, also received it from Mr. Matthews in S. Devon, and it is in Mr. Dale's collection.

#### *M. CILIARIS*, Ztt.

Dull grey; eyes in the female moderately separated; forehead rather prominent; frontalia white, with a rather narrow black central stripe; palpi yellow; antennæ with the third joint nearly twice as long as the second; arista thickened at the base, long, and very slightly pubescent; eyes very shortly haired; thorax with four black stripes, and three external dorso-central bristles behind the groove; abdomen cylindrico-conical, grey, with an irregular wide black band on the hinder portions of each segment, and with two discal setæ in the centre of the second and third segments, as well as two median apical ones; legs black; calyptra white; halteres yellow; wings with a distinct costal spine, and with the apical, as well as the outer cross veins, straight. Very rare; the male is not known.

#### *M. GRISEA*, Flin.

Dark grey; male with the eyes subcontiguous; female with them moderately wide apart, and with a broad rufous central stripe down the frontalia; antennæ black, with the second joint rufous in the female; palpi black; thorax with the dorsum black in the male, and the front edge and shoulders pale grey, it has three external dorso-central bristles, and is marked by four longitudinal black lines, which are much more distinct in the female, in which the dorsum is grey; abdomen grey

in both sexes, but darker in the male; it is without any definite markings, but very setose, and has the spines seated upon little black spots; the third segment is encircled by two transverse rows of bristles, as in *M. spini-cincta*; legs black; calyptra and halteres yellow; wings yellow at the base. Rare.

M. DISPAR, Fln.

*rufipes*, Mgn. and Macq.

*flavipes*, Mgn.?, ♀.

The male of this species is very much like that of the last (*grisea*), but differs in having yellow palpi, rufous or piceous basal joints to the antennæ, and reddish tibiæ, the abdomen also shows dark reflections; the female closely resembles the male, but has the abdomen lighter in colour, and the coxæ, femora, and tibiæ entirely yellow. Rare; in Mr. Dale's collection.

14.—POLIDEA, Mcq.

HARRISEA, Mgn., Rnd.

*Gen. ch.*—Eyes hairy, separated rather widely and equally in some species in both sexes, and also having the fronto-orbital bristles in a double row; in other species (according to Meigen) having the eyes of the males contiguous; antennæ with the third joint about twice the length of the second; arista bare; abdomen ovate, with or without discal setæ; wings with the first posterior cell nearly closed, and ending near the tip of the wing, apical cross veins mostly curved at the base, third longitudinal vein spinose.

P. CRASSITARSIS, Ztt.

*simplicitarsis*, Ztt.

*ænea*, Ztt., non Mgn.

*rebaptizata*, Rnd.

This little bronzed or bright black species (from 5 to 6 mm. in length), the only one recorded as British, closely resembles some of the *Macquartia*, it differs, however, by having the eyes widely separated, and the fronto-orbital bristles in a double row in both sexes; the sides of the frontalia are glazed and bronzed; the cheeks are white and bare; the chin is somewhat rufous and hairy; the arista is bare and thickened for two-thirds of its length; the thorax and abdomen are of a shining brassy or bluish-black colour, without any white tomentum or reflections; and the latter has setæ (rather small) both on the disc and edges of the segments; the legs are black, having the fore tarsi a little dilated in the female. The males have the fore tarsi simple, and may also be known by the shape of the abdomen, which is ovato-cylindrical with the apex thickened, while in the female is ovate, rather flattened, and pointed. I have selected Zetterstedt's name of *crassitarsis* in preference to the others, because it is more characteristic than *simplicitarsis*, which no doubt belongs to the male of the same species. The name of *ænea* was applied by Meigen to some other species, which seems to be now unknown, described as having the eyes contiguous in the male, and the abdominal segments without discal setæ; this was probably a *Macquartia*. Rare; the female is more common than the male.



## 15.—NEMORÆA, Dsr.

## NEMORÆA et PLATYCHIRA, Rnd.

*Gen. ch.*—Species mostly large, highly developed, and closely allied to each other; eyes hairy, more or less approximated in the male, but never contiguous, and always much shorter than the sides of the head; forehead prominent; antennæ drooping, with the second joint elongated, often nearly as long as the third; facialia bare; cheeks sometimes clothed with soft hairs; chin large, extending far below the eyes, and setose; abdomen oval, middle segments with or without discal setæ; fore tarsi more or less dilated in the females.

Rondani noticed that those species which have both marginal and discal abdominal setæ, which are by far the more numerous, have the fore tarsi of the females more dilated than those which are without the discal setæ; he therefore placed them in a separate genus, which he named *Platychira*; they resemble their congeners, however, so closely in all other characters that I think they should not be separated from them.

- [229]  
Aug., 1891.
- |            |      |                                                                                              |                                |
|------------|------|----------------------------------------------------------------------------------------------|--------------------------------|
| 1          | (4)  | Middle abdominal segments without discal setæ ( <i>Nemoræa</i> , Rnd.).                      |                                |
| 2          | (3)  | Abdomen black ... ..                                                                         | 1. <i>glabrata</i> , Mgn.      |
| 3          | (2)  | Abdomen red ... ..                                                                           | 2. <i>rubrica</i> , Mgn.       |
| 4          | (1)  | Middle abdominal segments with discal setæ ( <i>Platychira</i> , Rnd.).                      |                                |
| 5          | (6)  | Cheeks clothed with fine hairs ... ..                                                        | 3. <i>puparum</i> , Fln.       |
| 6          | (5)  | Cheeks bare.                                                                                 |                                |
| 7          | (18) | Palpi yellow or rufous.                                                                      |                                |
| 8          | (9)  | Antennæ with basal joints yellow ... ..                                                      | 4. <i>strenua</i> , Mgn.       |
| 9          | (8)  | Antennæ black.                                                                               |                                |
| 10         | (15) | Thorax with three stripes.                                                                   |                                |
| 11         | (12) | Scutellum with apex red ... ..                                                               | 5. <i>vagans</i> , Mgn.        |
| 12         | (11) | Scutellum black.                                                                             |                                |
| 13         | (14) | Wings with cubital appendix ... ..                                                           | 6. <i>appendiculata</i> , Mcq. |
| 14         | (13) | Wings without cubital appendix ... ..                                                        | 7. <i>nemorum</i> , Mgn.       |
| 15         | (10) | Thorax with four stripes.                                                                    |                                |
| 16         | (17) | Thoracic stripes narrow, and placed at equal distances from each other...                    | 8. <i>rudis</i> , Fln.         |
| 17         | (16) | Thoracic stripes wide, and middle ones nearer to each other than to the outer stripes ... .. | 9. <i>consobrina</i> , Mgn.    |
| 18         | (7)  | Palpi black.                                                                                 |                                |
| 19(20)(21) |      | Abdomen marked with two well defined, broad, transverse, white bands...                      | 10. <i>radicum</i> , F.        |
| 20(19)(21) |      | Abdomen marked with two broad, undefined, white bands or tessellations                       | 11. <i>cæsia</i> , Fln.        |
| 21(19)(20) |      | Abdominal bands very narrow, and wings with short cubital appendages                         | 12. <i>intermedia</i> , Zett.  |



All the species of *Nemoræa* have the *thorax* black or grey, sometimes with a green or bluish tinge; it is always also more or less distinctly marked with either three or four longitudinal stripes, and whitened with grey tomentum on the front margin and sides; in my diagnosis of the different species I shall, therefore, only mention its colour when it varies from the ordinary type. The same remarks will apply to the colour of the legs, which is black or dark grey in all the species.

#### N. GLABRATA, Mgn.

I have not seen either a British or foreign specimen of this species, but have introduced it owing to its being recorded as British by Mr. F. Walker in the supplementary list of British Tachinids published in the Appendix to the second vol. of the *Insecta Britannica*.

#### N. RUBRICA, Mgn.

This and the foregoing species are the only two recorded British ones that belong to Rondani's restricted genus *Nemoræa*, in which the middle abdominal segments are without setæ on the disc. *N. rubrica* has the thorax marked with four longitudinal stripes of nearly equal width, and has four external dorso-central bristles behind the transverse groove; the scutellum is reddish-brown, the apex usually only being rufous in the female; the palpi and the two basal joints of the antennæ are red; the abdomen is reddish-yellow with a black longitudinal stripe, and shows white reflections; the wings are brown with yellow roots. Very rare. [230] Aug., 1891.

#### N. PUPARUM, F.

This is distinguished from all the other recorded British species by having the cheeks below the termination of the fronto-orbital bristles clothed with a few fine scattered hairs.\* The cheeks are white with black reflections, and the hairs upon them are pale in colour and not very easy to see. The chin is thickly covered with long hairs; the eyes are subcontiguous in the male; the palpi are yellow; the antennæ have the basal joints grey or sometimes red, and the third joint black-brown with the base often red; the thorax has three stripes, the central one being very wide, and four external dorso-central bristles behind the transverse groove; the scutellum is rufous; the abdomen is blackish-brown, the sides of the second and third segments being red in the male; the front borders of the second, third and fourth segments are also encircled with an even, wide, subinterrupted white band; the wings have the fourth longitudinal vein bent at an acute angle, the external cross vein sinuous, and the little cross vein nebulous. Rare.

#### N. STRENUA, Mgn.

This has the cheeks quite bare; the antennæ are in great part yellow, and paler in the female than in the male; the eyes in the male are subcontiguous; the peristome is red; the thorax is marked with four rather narrow stripes, and has four

\* These characteristic hairs must not be confounded with others that are present on the sides of the frontalia in this and other species between the fronto-orbital bristles and the eyes.

external dorso-central bristles behind the transverse groove; the scutellum is red, with the base mostly black; the abdomen is shiny black, having red sides in the male and indistinct white transverse bands; the wings are yellow at the base, with the external cross vein oblique and sinuous, and the little cross vein nebulous. Not common. I found both males and females in Oxfordshire in 1883, it is also in Miss Decie's collection captured at Westward Ho! and I received a specimen from Mr. Harwood of Colchester.

#### N. VAGANS, Mgn.

This differs from the former by having the antennæ more nigrescent, the apex of the second joint and the base of the third only being rufous; by the thorax being marked with three instead of four stripes, and by the scutellum being red only at the tip. Rare. Captured by Mr. C. W. Dale at Blair Athol in June, 1883; found also by Mr. Harwood at Colchester.

#### N. APPENDICULATA, Mcq.\*

[231] This has the eyes in the male rather widely separated, the frontal space occupy-  
 Aug., 1891. ing about one-fourth of the width of the head; the frontal stripe dark brown; the sides of frontalia and face yellowish-white with black reflections; the antennæ black, with the second joint nearly as long as the third; the arista with the second joint somewhat elongated; the palpi piceous;† the thorax with three stripes, and having three external dorso-median bristles behind the transverse groove; the scutellum quite black; the abdomen shiny greenish-black, with white tessellations on the sides, but no red; the wings have the fourth longitudinal vein bent at a right angle, and then forming nearly a straight and oblique apical cross vein, also giving off at the angle an appendix of moderate length, it occupying about one-third of the space from the angle to the margin of the wing; the external cross vein is nearly straight, the little cross vein is nebulous. I have only seen one specimen (a male) of this well-marked species, which was sent to me in January, 1891, by Mr. Dale for my inspection.

#### N. NEMORUM, Mgn.

This rare species has been recorded as British by F. Walker, but I have not seen a specimen. It differs from *N. vagans* by having the scutellum quite black, the apical cross vein nearly straight, and the little cross vein unclouded; it may also be distinguished from *N. appendiculata* by the eyes of the male being sub-contiguous, and by the absence of the cubital appendix, as well as of the nebulosity of the little cross vein.

#### N. RUDIS, Fln.

The diagnosis between *N. rudis*, Fln., and *N. consobrina*, Mgn., is involved in a good deal of obscurity. Fallen's description of the former is very vague, and throws no light upon the subject. Rondani does not mention *N. rudis*, but his remarks respecting *N. consobrina* correspond with those applied to *N. rudis* by Meigen, Zetterstedt, and Schiner; all of whom say that the thorax in the latter species is marked by four narrow black lines. Meigen's description of *N. consobrina*

\* Ann. d. l. Soc. Ent. de Fr., 11, 6, 112.

† Macquart says that they are black, with the bases testaceous.

is very brief, he only says that the thorax is marked by four stripes, stating nothing as to their width. Schiner is the only author who clearly defines the difference between the two species, and as I have specimens which correspond to his descriptions I shall follow them.

N. RUDIS, Fln. ?, Mgn., Zett. et Schn.

*P. consobrina*, Rnd.

Thorax marked by four narrow black stripes, which are equal in width and placed at equal distances from each other; external dorso-central thoracic bristles three in number behind the transverse groove; eyes in the male separated by an interval occupying about one-fifth of the width of the head, those of the female not much wider apart; antennæ black, tinged with red at the junction of the second and third joints, which colour is more marked in the female than in the male; palpi yellow; scutellum more or less rufous towards the apex; abdomen black, sides red in the male, and marked by grey tessellations in both sexes; wings with the apical cross veins much curved, the outer cross vein a little sinuous, and the little cross veins rather nebulous. Not uncommon.

N. CONSOBRINA, Mgn. ?, Sch. *non* Rnd.

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Thorax striped in front by four wide black bands, the central pair of which are placed near together; posterior outer dorso-central bristles three in number; antennæ black; palpi yellow; scutellum black; abdomen as in *N. rudis*; wings with the apical cross vein rather oblique, and less curved than in *N. rudis*; the outer cross vein sinuous, and the little cross vein almost clear. Rare.

N. RADICUM, F.

This, the most common species in the genus, has the antennæ and palpi black, the latter being sometimes pale or red at the ends; the eyes are separated by nearly an equal interval in both sexes; the thorax has four rather narrow stripes, and three external dorso-central bristles behind the transverse groove or suture; the scutellum has the apex mostly red; the abdomen is shiny black, with two well defined broad transverse bands, and has the sides red, and somewhat diaphanous in the males; the wings are tinged with brown, and have the veins, especially the little cross ones, rather nebulous, and the apical cross veins much curved. Generally distributed.

N. CÆSIA, Fln.

This closely resembles *N. radicum*, but is quite distinct; the thoracic stripes are wider; there are four instead of three external dorso-central bristles behind the suture; the third antennal joint is shorter, being scarcely as long as the second; the abdomen has the sides irregularly tessellated with white, instead of being encircled with white bands; the wings are clearer, the little cross veins are unclouded, and the apical cross veins are more oblique and less curved. Very rare; I have only seen one British specimen, which was in the late F. Walker's collection.

N. INTERMEDIA, Ztt.

*setosa* ?, Mcq.

This species is of a bright blue-black colour, with a convex subcylindrical

abdomen having large, recurved, subglobose anal segments;\* the antennæ are rather short and black; the palpi are filiform and black; the frontalia are wide, the eyes of the male being more widely separated than in any other species; the thorax is marked with four indistinct black stripes, and has three outer dorso-central bristles behind the suture; the tip of the scutellum is red; the abdomen is of a bright shiny black colour, with the vestiges only of white interrupted bands; the wings have very short cubital appendices. *N. setosa*, Mcq.,† seems closely to resemble this species in form and colour, only differing by having the palpi yellow instead of black, and having no appendices to the wings, it is probably only a variety of the same. Very rare; I have only seen two examples (both males), which I obtained with other unnamed British species from the late F. Walker.

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#### 16.—CHETOLYGA, Rnd.

NEMORÆA, pt. Mgn., Mcq., Schn.

*Gen. ch.*—Eyes hairy, more or less approximated in the males, and prolonged to near the bottom of the sides of the head and face; antennæ drooping, second joint elongated, and more than half the length of the third; cheeks hairy; chin short; facialia nearly or quite bare; abdomen without discal setæ on the middle segments; hind tarsi of females not dilated.

- |   |     |                                                                                                         |                                |
|---|-----|---------------------------------------------------------------------------------------------------------|--------------------------------|
| 1 | (2) | Anal segments black .....                                                                               | 1. <i>amæna</i> , Mgn.         |
| 2 | (1) | Anal segments red.                                                                                      |                                |
| 3 | (6) | Thorax with five stripes.                                                                               |                                |
| 4 | (5) | Antennæ with third joint widened, and second abdominal segment with four marginal dorsal bristles ..... | 2. <i>analís</i> , Mcq.        |
| 5 | (4) | Antennæ with third joint narrow, and second abdominal segment with only two bristles .....              | 3. <i>nigrithorax</i> , Egg.   |
| 6 | (3) | Thorax with four stripes .....                                                                          | 4. <i>quadripustulata</i> , F. |

#### C. AMÆNA, Mgn.

*N. exacta*, Wlk.

Eyes of male approximated; antennæ black, with the third joint rufous at the base, and about one and a half times as long as the second; cheeks thinly clothed with fine black hairs; palpi red; thorax black, thickly coated on front and sides with white pubescence, and marked upon the dorsum with five distinct longitudinal striæ; also having four external dorso-central bristles behind the transverse groove; scutellum rufous; abdomen black, with sides red in the male, and marked in both sexes with broad tessellated irregular white bands; anal segments black; legs black, tibiæ sometimes piceous. Rare; found by Mr. Harwood, of Colchester, who kindly sent me a female; it is also in Mr. Verrall's collection, who possesses the typical specimen named *N. exacta* by Walker.

#### C. ANALIS, Mcq.

*cruentata*?, Rnd.

Eyes sub-approximate in the males, and not very widely separated in the

\* The shape of the abdomen is very similar to that of *Cynomyia mortuorum*.

† Ann. d. l. Soc. Ent. de Fr., 11, 6, 116.

females; cheeks yellow or white, and glistening, having brown reflections, and furnished with fine black hairs; fronto-orbital bristles long and numerous, being very thickly set and rather irregular in the males; antennæ rather long, the second joint being about two-thirds of the length of the third joint, which is somewhat dilated, especially in the females; arista long, and thickened for half its length; palpi rufous; thorax shiny blue-black in the male, with a little grey or tawny pubescence on the sides and front margin, and marked with five rather indistinct longitudinal stripes; the female has the stripes much more distinct, and the thorax clothed with more pubescence; the external dorso-central bristles are four in number behind the transverse groove; scutellum rufous; abdomen black, with the sides and anus red in both sexes, and transversely banded with white tessellations; the first segment is quite black, armed on the margin with two central dorsal setæ, the second segment having four setæ; legs black, hind tibiæ ciliated externally with an even row of rather short bristles; the wings have the outer cross veins very sinuous. Rare; Mr. Billups sent me a male, which he had captured at Dulwich.

### C. NIGRITHORAX, Egg.

*cilicrura* ?, Rnd.

This species is so similar in most of its characters to *C. analis*, that I shall only point out the chief marks of distinction between them. The antennæ are shorter, and the third joint is narrow and undilated; the fronto-orbital bristles are less numerous, being placed further apart; the palpi are dark at the base, and have their ends quite pale; the first abdominal segment has no large setæ on its margin, and the second segment is armed with only two spines instead of four, as in *C. analis*. This is also rare; Mr. Billups sent me one for my inspection, bred from *Saturnia carpinii*.

### C. QUADRIPUSTULATA, F.

*T. æstuanis*, Fln.

*N erythrina* ?, Mgn.

*T. dispecta* ?, Wlk.

This species bears a great general resemblance to both the preceding ones, and Fabricius probably confounded all three together. The eyes are approximated in the male, and moderately remote in the female; the fronto-orbital bristles are numerous, but not very large; the antennæ are black, those of the male have the second joint elongated, and about two-thirds of the length of the third, which is rather narrow; in the female the second joint is rather short, and only about half the length of the third, which is wide; the arista (especially in the male) is long and thickened for about half its length; the palpi are testaceous; the thorax in the male is shiny blue-black with little pubescence, and rather indistinctly marked on the front part with four longitudinal lines of moderate width; in the female the thorax is covered with hoary pubescence or tomentum, and very distinctly striped, the stripes extending over the whole dorsum; there are four external dorso-central bristles behind the transverse groove; the scutellum is tawny; the abdomen is more or less extensively marked on the sides with red or yellow in the male, the apex and venter being also of the same colour, the dorsum is shiny black, with some white tessellations on the edges of the segments; in the female the abdomen is dark grey,

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tessellated with black and white, having an indistinct black dorsal band, and sometimes a little red on the sides of the middle segments; the anus is always red; the first abdominal segment, which is black, has two long bristles on the edge in the centre, the second segment has four setæ in the same position in the female, and usually six in the male; the wings have the outer cross veins a little sinuous; the legs are black, and have the hind tibiæ ciliated, as in the two preceding species. Rare; it is in Mr. Coryndon Matthew's collection, and in Mr. Verrall's; the latter kindly sent for my inspection Walker's typical specimen of *T. dispecta*, which I find to be a well marked example of the present species. Walker describes the palpi as being black, but I find them pale in colour, in his own specimen.

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#### 17.—NEMORILLA, Rnd.

NEMORÆA, pt. Mgn., Meq., Schn.

*Gen. ch.*—This genus, like the former (*Chetolyga*), differs from *Nemoræa* by having the eyes prolonged, and the chin short, so that the antennæ are inserted above, instead of opposite to, the centre of the eyes. The points of distinction between *Chetolyga* and *Nemorilla* are, that in the latter the cheeks are bare, instead of being hairy, and the central abdominal segments are armed with setæ both on the disc and on the edges, instead of only on the latter parts, as in *Chetolyga*. The two genera agree in all other essential points.

N. FLORALIS, Fln., Zett., non Mgn.

notabilis, Mgn., Schn.

*T. intersita* ?, Wlk., ♀.

This, the only recorded British species, has the eyes approximated in the male, and rather widely separated in the females; the antennæ have the third joint rather narrow, and about one-third longer than the second; the arista is long, and thickened for nearly half its length; the palpi are black in the male, but sometimes pale in the female; in which sex the basal joints of the antennæ are also sometimes rufous; the thorax is black, with grey pubescence, and marked with three wide black stripes, the middle one, which is the broadest, being often divided into three; the scutellum is black or grey; the calyptra are dirty white; the abdomen is black, covered with grey pubescence, and marked by a dorsal black line, and with transverse dentated bands on the second and third segments, that on the former being wider than the other, and having the marks running together to form a somewhat square-shaped spot; the anal segments are black, the sides of the second segment are generally slightly rufous in the male; the wings have the outer cross vein sinuous; the legs are black, and have the hind tibiæ ciliated externally with slightly uneven bristles. This fly is not uncommon; I received one many years ago from the late Mr. Cooke, of Bowdon, which he had bred from *Bolys verticalis*, and Mr. Billups has one reared from *Plusia festuæ*. Mr. Verrall kindly sent for my inspection the typical specimen of Walker's *T. intersita*, which he had obtained from the late M. Desvigne's collection. I find that it is a female of the present species, though Walker's own description does not exactly agree with it, for he says that it should have four dorsal thoracic stripes, whereas the specimen has but three, or rather five, the central one being divided.



18.—OLIVIERIA, Desv. *non* Mgn.

PANZERIA, Mgn.

*Gen. ch.*—Eyes thinly haired, sometimes nearly bare, approximate in the male, and rather remote in the female; cheeks and facialia bare; antennæ free, with the second joint elongated, and nearly as long as the third; arista with the second joint a little prolonged, and the third thickened at the base, rather short, and sub-pubescent; [266] epistome prominent; proboscis long, slender, and porrected; abdomen Oct., 1891. oblong and elliptical, armed with setæ on the disc of the segments; wings with the first posterior cells very slightly open at the apex, and often quite closed or even stalked. This genus is rather aberrant, and from the structure of the wing it might be placed in the second division of my analytical table.

## O. RUFOMACULATA, De G., Rnd.

*lateralis*, F., Mgn., *et alia*.

Checks and sides of frontalia silvery-white, with black reflections; antennæ and palpi black; thorax grey, with four black stripes, the central pair narrow, the outer ones broad; abdomen black, the rings with narrow white bands on their front edges, and having the sides of the three first ones dark red; wings greyish, with the roots, front margin, and sometimes the borders of the veins ochreous. Common.

## 19.—ZOPHOMYIA, Mcq.

EREBIA, Desv., Mgn.

AVERNIA, Rnd.

*Gen. ch.*—This small genus contains one or two shiny black bristly species, resembling some of those in *Macquartia* in general appearance, but differing by being more setose, and having the eyes widely and nearly equally separated in both sexes. The eyes are thinly but rather longly haired in the males, and almost nude in the females; the fronto-orbital bristles are in a double row on each side towards the vertex in both males and females; the antennæ are drooping, with the second joint rather long, but nearly one-half shorter than the third; the arista is rather short and thickened at the base; the abdomen is conico-cylindrical, with setæ on both the middle and edges of the rings, the anal segments in the male are rather large and incurved; the wings have large costal spines, and the angle at the base of the apical cross veins somewhat rounded; the legs are very spinose.

## Z. TEMULA, Scop., Schn.

*tremula*, L. F., Mgn., Mcq., *et alia*.*flavipalpis*?, Mcq., pt.

This is rather a peculiar-looking fly, having a shining black body with bright reddish-yellow scales and basal halves of the wings; the forehead is prominent; the antennæ black, with a red tinge at the end of the second joint; the palpi have the bases dark, and the ends reddish-yellow;\* the thorax, like the abdomen, is immaculate, has a little white pubescence on the front edge, and numerous strong bristles on

\* I have only examined three specimens, which all have the palpi of this colour; they are generally described as being black; are these belonging to Macquart's *flavipalpis*?

the sides; the abdomen is conico-cylindrical, very glabrous, and has all the setæ large, and those on the fourth segment very numerous; the wings have the fourth longitudinal vein bent at rather a rounded angle, and the outer cross vein a little curved, but not usually sinuous; the legs are black, and armed with numerous strong spines irregularly arranged. Not common.

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## 20.—EPICAMPOCERA, Meq.

*Gen. ch.*—Eyes hairy, nearer together in the males than in the females; palpi projecting and a little clavate, forehead very slightly prominent; epistome flat; cheeks minutely ciliated; facialia almost bare; antennæ with the second joint short, the third three or four times as long, thick, with the front surface convex, and the end rounded; abdomen oval, with the segments armed with setæ both on the disc and edges.

## E. SUCCINCTA, Mgn.

Blue-black, with black palpi, antennæ, and legs; frontal stripe brown; sides of frontalia bluish; face white, with blue reflections; fronto-orbital bristles extending down one-fourth of the length of the face, four being placed below the base of the antennæ; arista long, thickened for about two-thirds of its length, and minutely pubescent; thorax indistinctly striped with four slender lines; scutellum black; abdomen glabrous, with white reflections, which assume the form of irregular transverse bands when viewed from behind; wings with the apical cross veins nearly straight, and the outer cross veins a little sinuous at the base. Not uncommon.

## 21.—EXORISTA, Mgn.

*Gen. ch.*—Species mostly of moderate size and oval shape; eyes hairy, rather widely separated in both sexes, and prolonged down the sides of the face; forehead mostly short; antennæ with the second joint rather short, and the third from twice to six times as long; front surface of the latter straight, or nearly so; arista with the second joint often a little elongated; cheeks bare;\* facialia unarmed, or only ciliated with short weak bristles along their lower halves; abdomen sometimes with and sometimes without discal setæ on the middle segments; wings with the fourth longitudinal vein with an angular bend, and the first posterior cell partly open, and terminating a little before the tip of the wing.

The species are very numerous; almost all those that I have examined have four external dorso-central thoracic bristles behind the transverse suture, so I shall only mention them when they vary from that number; most of them also have the thorax and abdomen very similarly coloured and marked, so that the specific characters must be taken chiefly from differences in the colour of the palpi, scutellum,

\* Sometimes the fronto-orbital bristles extend down the face, but they are never ciliated with fine hairs as in the preceding genus.

and legs, from the presence or absence of discal setæ on the central abdominal rings, from variations in the length of the antennæ (those of the male are often longer than those of the female), from the degree of extension of the fronto-orbital bristles on the cheeks, and other minor points of structure.

- 1 (10) Palpi black.
- 2 (3) Scutellum partly red ..... 1. *vulgaris*, Fln.
- 3 (2) Scutellum black or grey.
- 4 (3) Fronto-orbital bristles extending to near the bottom of the cheeks...  
2. *amplicornis*, Ztt.
- 5 (4) Fronto-orbital bristles not extending below the middle of the cheeks.
- 6 (9) Apical cross vein of wings nearly straight, and first posterior cell always a little open.
- 7 (8) Arista thickened to the middle..... 3. *fimbriata*, Mgn.
- 8 (7) Arista long, slender, and only thickened at the base... 4. *mutabilis*, Fln.
- 9 (6) Apical cross vein much curved, and first posterior cell nearly or quite closed ..... 5. *dubia*, Fln.
- 10 (1) Palpi red or partly red.
- 11 (26) Legs wholly or partly red or yellow.
- 12 (13) Legs wholly yellow ..... 6. *vetula*, Mgn.
- 13 (12) Femora black, but tibiæ yellow or red.
- 14 (15) Fronto-orbital bristles in a double row in the males... 7. *biserialis*, Mcq.
- 15 (14) Fronto-orbital bristles in a single row in the males.
- 16 (21) Sides of the abdomen mostly marked with red.
- 17 (20) Middle abdominal segments without discal setæ.
- 18 (19) Frontal stripe as wide or wider than the sides of the frontalia...  
8. *lucorum*, Mgn.
- 19 (18) Frontal stripe narrower than the sides of the frontalia... 9. *gnava*, Mgn.
- 20 (17) Middle abdominal segments armed with discal setæ... 10. *chelonix*, Rnd.
- 21 (16) Sides of the abdomen without red marks.
- 22 Colour whitish or yellowish-grey.
- 23 (25) Scutellum quite red ..... 11. *leucophæa*, Mgn.
- 24 (23) Scutellum with only the tip red..... 12. *albicans*, Fln.
- 25 (23) Scutellum black..... 13. *perturbans*, Ztt.
- 26 (11) Legs black.
- 27 (42) Scutellum red or partly red.
- 28 (31) Middle abdominal segments without discal setæ.
- 29 (30) Thorax indistinctly marked, scutellum all red ..... 14. *fauna*, Mgn.
- 30 (29) Thorax distinctly striped, scutellum only red at the tip...  
15. *acronyctarum*, Mcq.
- 31 (28) Middle abdominal segments with discal setæ.
- 32 (35) Abdomen with apex red.
- 33 (34) Wings with little cross vein clouded..... 16. *ruficauda*, Ztt.
- 34 (33) Wings with cross veins clear ..... 17. *apicalis*, Mgn.
- 35 (32) Abdomen with apex black.
- 36 (37) Palpi with tips only red ..... 18. *lota*, Mgn.
- 37 (36) Palpi wholly red or yellow.

- 38 (41) Apical cross vein of wings curved.  
 39 (40) Wings with cubital appendix ..... 19. *grandis*, Ztt.  
 40 (39) Wings without appendix ..... 20. *affinis*, Flin.  
 41 (38) Apical cross vein straight ..... 21. *noctuicida*, Rnd.  
 42 (27) Scutellum quite black ..... 22. *jucunda*, Mgn.

### E. VULGARIS, Flin.

This, which may be considered as the typical species in the genus, with which many of the others may be compared, may be known from all the other British ones with which I am acquainted by having the palpi, antennæ and legs black, and the scutellum with a red apex.\* The eyes are widely and almost equally separated in both sexes; the fronto-orbital bristles have four or five setæ, which extend on to the cheeks in an even row below the roots of the antennæ; the latter have the third joint usually four times as long as the second, with the front margin nearly or quite straight; the arista has the second joint somewhat elongated, and the third thickened for fully half its length; the facialia are mostly ciliated along their lower halves with small bristles; the thorax is dull black, covered with hoary pubescence and marked with four longitudinal lines, the central pair being narrow and the outer ones irregular and maculiform; the abdomen is hoary on the sides and front margins of the rings, and has their posterior edges and a central dorsal line black; the segments are armed with setæ both on the edges and disc; the wings have the apical cross vein a little curved, and the outer one slightly sinuous; the legs have the hind tibiæ ciliated with a nearly even row of bristles, which have one or two longer ones among them.

This species, which is one of the most common of all the *Tachiniidæ*, is exceedingly variable both in size and other characters; thus the third joint of the antennæ is sometimes not more than three times as long as the second, much thickened, and rounded at the end, when it probably becomes the *T. magnicornis* or *T. rotundicornis*, Ztt. Again, the palpi are often testaceous at their ends; the facialia also are sometimes nearly or quite bare, and the scutellum is occasionally black instead of having the end pale.

### E. AMPLICORNIS, Ztt.

This is rather an aberrant but well marked species. It is narrow and oblong in shape; the forehead is rather prominent; the eyes in the male approximated; the antennæ have the third joint about three times the length of the second, very thick, with the extremity rounded, and the front surface rather concave; the arista is rather short and thickened to beyond the middle; the fronto-orbital bristles extend down the cheeks almost to the bottom of the face, there being about eight below the roots of the antennæ; the facialia are almost bare; the palpi are black; the thorax is black, marked with four rather indistinct stripes; the abdomen is grey, tessellated with black; the first segment is nearly as long as the others, and they are all armed with setæ on the disc and edges; the scutellum is black or grey; the wings have the third longitudinal vein armed at its base with a row of six or seven setæ; the outer cross vein is seated nearly one-third nearer to the angle of the fourth longitudinal than to the little cross vein, the apical cross vein is a little curved, and terminates

\* See remarks upon *Ex. parvus*, Rnd., at the end of this genus.

a little before the apex of the wing, leaving the first posterior cell slightly open. Very rare. I have only seen one specimen (♂), which I captured near Buckingham in June, 1878. Zetterstedt refers this fly to Meigen's genus *Tryphera*, but I think it belongs more properly to *Exorista*, unless it be placed in a new genus.

### E. FIMBRIATA, Mgn.

This species is very similar in general appearance and character to *E. vulgaris*, but differs by having the scutellum quite black, by the general colour being more glabrous and bluish-black, by the eyes being nearer together, especially in the males, and by the antennæ being shorter, those of the male having the third joint only between two and three times the length of the second; the abdominal segments have setæ both on the disc and edges. Not common. I have captured it in Kent and in Oxfordshire.

### E. MUTABILIS, Fln.

This is one of the smallest Tachinids, being only about 4 mm. long; it is placed by Fallen, Zetterstedt and Meigen among those species which have naked eyes,\* but the specimen which I possess has them decidedly hairy, though the hairs are very short. The palpi, scutellum and legs are all black, the eyes are said to be somewhat approximated in the males, but are widely separated in the females; the forehead is rather prominent; the antennæ have the second joint a little elongated, and the third joint from two to three times as long; the arista is very long and thin, only thickened for a short distance at the base and slightly pubescent; the thorax is grey and marked by four slender black stripes; the abdomen is also grey with black tessellations, which assume the form of semilunar spots or marks at the bases of the second and third segments, which are armed with both discal and marginal setæ; the wings are a little nigrescent, the apical cross vein terminates near the apex, the first posterior cell is nearly closed, and there are three or four small setæ at the base of the third longitudinal vein.

I have only seen one female specimen of this little species, which I captured near Ulverston in Lancashire in August, 1888; the male is said to be more nigrescent and less distinctly marked. The abdomen of this fly is spotted in a very similar manner to that of *Nemorilla floralis*, Fln.

### E. DUBIA, Fln.

This little species is also aberrant, and Rondani suggests that it should be placed in a new genus, which he would name *APOROMYIA*; its chief peculiarities are—first, the insertion of the antennæ opposite the centre of the eyes, and not as in other species of *Exorista* a little above it; second, the almost or quite complete closure of the first posterior wing cell; and third, the position of the outer cross vein, which is nearly in the centre between the little cross vein and the bend of the fourth longitudinal. The eyes are approximated in the male; the antennæ in the same sex have the third joint only twice as long as the second, it is rather longer, however, and thicker in the female; the palpi are usually black, but sometimes rufous; the thorax is shiny black-brown in the male and indistinctly striped, grey

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\* It would thus be either a *Tachina* or a *Masicera*.



and marked with four lines in the female; the abdomen is grey, short and oval, tessellated with brown, and armed with setæ both on the disc and edges of the segments; the wings are tinged with brown, especially along the fore border, and the apical cross vein is deeply curved. This species closely resembles the *Tryphera umbrinervis*, Ztt., and I believe that they are only varieties of the same species. Not rare.

#### E. VETULA, Mgn.

This species has the legs entirely yellow, together with the palpi and scutellum; the facial angle is oblique; the eyes are widely separated; the antennæ are long, the first and second joints are short and rufous, the third is five or six times the length of the second, rather narrow, and black or grey; the thorax and abdomen are both brown, coated with ochreous pubescence; the former is marked by four black stripes, the latter is tessellated with brown, and armed with setæ on the disc and edges of the segments; the apical cross vein of the wings is nearly straight, and the outer one sinuous. Rare. I received one some years ago from Mr. Bignell, bred from a Lepidopterous larva found in the New Forest; Mr. Harwood, of Colchester, also gave me another a few months ago.

#### E. BISERIALIS, Mcq.

The eyes of the male are somewhat approximated; the fronto-orbital bristles are in two rows, the inner row extending half way down the face, the outer one consisting only of four setæ and not going beyond the base of the antennæ; the palpi are yellow and clubbed; the antennæ are black, with the third joint three to four times the length of the second; the arista is long and slender, and only thickened at the base; the thorax is grey, with four black stripes and has white shoulders, the scutellum is yellow; the abdomen is shiny metallic-brown (æneous), with somewhat narrow, white, transverse bands on the second and third segments, and is armed with rather small setæ on the disc and margins of the rings; the legs have the tibiæ testaceous or yellow. Very rare. I found a single male of this well marked species near Maidstone, in Kent, in June, 1888.

#### E. LUCORUM, Mgn.

The palpi, scutellum and tibiæ are rufous, also the sides of the first and second abdominal segments in the male. The frontal stripe is wider than the sides of the frontalia; the palpi are somewhat clavate at the ends; the antennæ have the third joint between two and three times longer than the second; the arista is long and slender, and only thickened along its basal third; the thorax is black and hoary, with four rather indistinct longitudinal lines; the abdomen is without discal setæ on the middle segments, and is tessellated with black and grey marks. Rare.

#### E. GNAVA, Mgn.

This species so closely resembles the former that I believe they are only varieties of the same. The frontal stripe is only as wide or even narrower than the sides of the frontalia; the third joint of the antennæ is fully three times as long as the second; the arista is thickened along half its length, and is less slender than in *E. lucorum*, and the redness on the sides of the abdomen extends a little on to the



third segment. This is also rare. Mr. Bignell sent me a pair some years ago bred from *Orgyia pudibunda*, and Mr. Dale has one in his collection reared from the same insect.

### E. CHELONIE, Rnd.

This is also closely related to the two preceding species, but differs from them both by having the middle abdominal segments armed with discal setæ; it resembles *E. lucorum* by having the arista long and slender, and only slightly thickened at the base, but has a rather narrow frontal stripe as in *E. gnava*. Not uncommon. It is in Miss Decie's as well as Mr. Dale's collection, and Mr. Inebald sent me several specimens which he bred from *Aretia caja* and *A. lubricipeda*.

### EXORISTA LEUCOPHLEA, Mgn.

Colour grey, scutellum quite yellow, also palpi; frontal stripe narrower than sides of the frontalia; antennæ with basal joints often partially red, third joint fully four times as long as the second in the male, but not more than three times in the female; thorax with four stripes, the outer ones maculiform; abdomen without red marks on the sides, light grey with a few dark tessellations, discal setæ very small upon both middle segments, and often wanting altogether on the second one; wings yellowish; legs with the tibiæ only partially yellow in the males, but sometimes wholly so in the females. Rare. I have only seen one British specimen, which was sent to me by the Rev. E. N. Bloomfield for identification.

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### E. ALBICANS, Flin.

This species somewhat resembles the former, but is only about half the size, being not more than 4—5 mm. in length, and has only the tip of the scutellum yellow; the colour is whitish-grey, the antennæ have the basal joints pale, and the third about three times the length of the second; the palpi are yellow; the thorax is striped in the middle with two very narrow lines, and has the sides almost immaculate; the abdomen is tessellated with brown, has the front edges of the segments pale, and the disc and edges armed with setæ; the wings are yellowish; the hind tibiæ testaceous. Not common. I have found it near Lake Windermere, and it is in Miss Decie's collection.

### E. PERTURBANS, Zitt.

This little species is very like *E. albicans* in general characters, but is much darker in colour, and has the thorax more distinctly striped; the antennæ are quite black, have the second joint very short (hardly longer than the first), and the third five or six times as long, and also very thick, with the end pointed in front and rounded behind; the arista is thickened for half its length, and slightly pubescent; the palpi are testaceous, as well as the tibiæ; the wings are white or slightly nigrescent, without any yellow tinge. Rare. I have only seen one specimen, which I captured near Bradford.

### E. FAUNA, Mgn.

This species is characterized by having the legs quite black; the palpi and scutellum rufous; and the middle abdominal segments without discal setæ. The forehead is prominent; the thorax is greyish-black, shining and indistinctly striped; the abdomen is clear grey, marked with brown reflections, and has the dorsum marked with a longitudinal black line, the hind edges of the second, third and fourth segments are also black, and the first segment is quite black. Rare. Mr. Dale has a specimen bred from *C. ligniperda*, and Mr. Bignell sent me one reared from the same moth.

## E. ACRONYCTARUM, Meq.

*E. hortulana*, Mgn.?, part.

This is a blue-black fly, with black legs, yellow palpi, black scutellum with rufous tip, and no discal setæ on the second abdominal segment. The palpi are a little clubbed at the ends, which are pale yellow or testaceous, the roots being dark; the antennæ have the third joint about three times the length of the second; the arista has the second joint short, and the third long and thin, thickened to about half its length; the eyes are rather short haired, those of the female being almost nude; the thorax is marked by four black stripes; the abdomen is glabrous, blue-black, with black and white tessellations, the second segment has two central setæ on the posterior edge, but none on the disc; the third segment has some discal setæ as well as marginal ones. In some specimens the scutellum is nearly or quite black, and I believe it is then the same species as Meigen's *E. hortulana*, though he does not notice the absence of setæ on the second abdominal segment. In 1879 I described it under that name in the Naturalist from a specimen which I had bred from *Acronycta alni*, but I had not then had an opportunity of seeing Macquart's papers on the *Tachinidæ* in the Annals of the French Entomological Society. I have since received many specimens of this fly from Messrs. Mosley, Porritt, Fitch, Bridgman, and others, all of which have been bred from either *Acronycta alni* or *A. psi*, so Macquart's name is very appropriate.

## E. RUFICAUDA, Ztt.

This is a well marked little species, characterized by having the anal segments of the abdomen red in both sexes; the middle segments armed with setæ on the disc; the external dorso-central thoracic bristles, three in number only, behind the transverse suture; the third longitudinal wing vein with five or six setæ at its base; the little cross vein nebulous; the apical cross vein much curved like that in *E. dubia*; and the fore tarsi in the female dilated. Rare. Mr. Fitch gave me a specimen bred from *Ypsipetes impluriata*.

## E. APICALIS, Mgn.

This species has the anus red like the last, but the little cross vein is clear, and the apical one straight instead of being curved. The eyes of the male are approximated; the third joint of the antennæ is only about twice the length of the second; the fronto-orbital bristles only extend to about the base of the antennæ, but at a little distance below them there is another row of little setæ on the cheeks; the thorax is of a bluish colour, and the legs have brown tibiæ. Very rare. I have only seen one example, which is in Mr. Dale's collection. Schiner says that it has been bred from *Saturnia carpini*.

## E. LOTA, Mgn.

This fine species (10—11 mm. long) is chiefly characterized by having black palpi with red tips, which are also rather clavate. The colour of the thorax and abdomen is bluish-black, coated with hoary pubescence; the former is marked by four slender, rather indistinct lines, the latter is tessellated with black and white;

the middle abdominal segments being armed with setæ on the disc, those on the second ring being very small; the forehead is a little prominent in the male; the antennæ have the third joint fully three times as long as the second; the arista is long and slender, a little thickened at the base, and slightly and gradually tapering towards the end; the scutellum is yellow, and the hind tibiæ are ciliated with an even row of bristles in both sexes. Not common. Mr. Dale sent me a specimen from a *Tæniocampa*, Mr. Bignell one from *A. psi*, and Mr. Fitch one from *A. trideus*.

### E. GRANDIS, Ztt.

This, about the largest of the *Exoristæ*, being from 10—12 mm. in length, is very similar in size, shape and general appearance to *Tachina larrarum*. It has the same shaped apical cross wing veins, they being long, curved, oblique, and furnished with a cubital appendix. The forehead is prominent; eyes widely separated in both sexes; the frontalia occupying about a fourth of the width of the head in the male, and a third in the female; the antennæ are drooping, the second joint is rather elongated, and the third about two and a half times as long; the arista has the second joint distinctly shown, and the third long and thickened for rather more than half its length; the palpi are yellow and filiform; the fronto-orbital bristles extend down two-thirds of the face, six or seven being below the roots of the antennæ; the facialia are bare; the thorax is dull black, covered with hoary pubescence, which is thick and white on the front margin; it is marked by four rather wide black stripes; the scutellum is more or less rufescent; the abdomen is marked by three grey bands, the second segment has two large central bristles on the margin, but none on the disc; the third segment has one or two on the disc, in addition to those on the margin; the aperture at the end of the first posterior wing cell is very small; the outer cross vein is sinuous; the hind tibiæ are ciliated with nearly an even row of bristles, having one long one near the centre. This fly is in Mr. Dale's collection, reared from *Saturnia carpini*, and I have received specimens from Messrs. Mosley, Bignell, and Fitch, all of which were bred from the same moth. Prof. Mik says that the *T. pavoniæ*, Ztt., is identical with this species.

### E. AFFINIS, Flin.

This species has the palpi and scutellum yellow, and the sides of the second segment of the abdomen red. The thorax is black and shining, with four indistinct black stripes, and only three external dorso-central bristles behind the suture; the abdomen is black, glabrous and very setose, having both discal and marginal bristles on all the segments; it is also tessellated with white patches; the antennæ have the third joint only a little more than double the length of the second; the fronto-orbital bristles extend half way down the face; the sides of the frontalia are black and glistening in the female; the wings are yellowish-brown, with curved apical cross veins. Walker includes this species in his list, but his description does not correspond with that of other authors, nor with the character of the fly itself, typical specimens of which I have received from the Continent. Very rare.

### E. NOCTUICIDA, Rnd.

This has the palpi yellow, and the end of the scutellum a little rufous. The eyes of the male are approximated, the frontal stripe is as wide or wider (in most

specimens) than the sides of the frontana; the fronto-orbital bristles only extend a short way down the face, three or four being placed below the roots of the antennæ in an irregular row or patch (especially in the male); the third joint of the antennæ is about four times the length of the second; the facialia are almost nude; the thorax is black, very hoary on the front and sides, and marked by four slender stripes; the abdomen is rather setose, having bristles both on the disc and margins of the segments, it has the sides hoary, with the centre of the dorsum black, as well as the hind margins of the segments; the wings have the outer and apical cross veins both nearly straight, the former being placed near to the angle of the latter. I received three specimens of this rare fly from Mr. Fitch some years ago, all of which were bred from *Acronyeta tridens*.

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### E. JUCUNDA, Mgn.

This rather small species (6 mm. in length) has the scutellum wholly black or rather grey. The palpi are yellow; the antennæ long, thick and straight, the second joint being very short, and the third five or six times as long; the arista is thickened for nearly two-thirds of its length, the thickened portion ceasing rather abruptly; the thorax and abdomen are grey, being coated with hoary pubescence, the former has four stripes, the central pair narrow and the outer ones wide and interrupted; the abdomen is tessellated with black patches, which assume the form of black bands when viewed from behind; the segments are armed with rather small setæ on both the discs and posterior edges; the venter is grey with white margins to the segments;\* the wings have the apical cross veins concave, and terminating close to the apex of the wing. Not common. I found one specimen at Bingley, near Bradford, in 1874, and another at Silverdale in North Lancashire in 1881; it is also in Miss Decie's Collection.

*E. parens*, Rnd., has been recorded as a British species, and in 1880 I received two flies from Mr. Bignell (bred from *Polia flavicincta*) which I thus named; upon further research, however, I believe that they were only varieties of *E. vulgaris*, and I now doubt whether *E. parens* is a distinct species. *E. prominens*, Mgn., is another doubtful species, Meigen omitting the colour of the palpi. I formerly labelled several specimens with this name, one of which is in Mr. Dale's collection. I now think that they are also varieties of *E. vulgaris*.

### 22.—TACHINA, Mgn.

*Gen. ch.*—Eyes nude, or finely pubescent, rather widely separated in both sexes, but nearer together in the males than in the females; forehead not usually very prominent; facial angle mostly straight; antennæ nearly drooping, with the second joint elongated, and half, or rather more than half, as long as the third joint; arista bare, and usually thickened for half its length; facialia bare, or only ciliated along their lower halves with short fine bristles; cheeks nude; fronto-orbital setæ usually extending half way down the face; abdomen mostly conico-elliptical in the male, ovoid in the female, and either with or without discal setæ on the middle segments; wings with the fourth longitudinal vein usually bent at a sharp angle, and often furnished with a spurious, or nearly spurious, cubital appendix.

The species are mostly of a middle size, of a greyish-black colour, and marked on the thorax and abdomen in a very similar manner to those in the genus *Exorista*.

- 1 (22) Legs black.
- 2 (16) Palpi yellow or red.
- 3 (14) Wings with an appendix.
- 4 (11) Scutellum partly or wholly rufous.
- 5 Middle abdominal segments without discal setæ.
- 6 (9) Face generally luteous.
- 7(8)(10) Frontal stripe narrower than the sides of the frontalia, and the facial setæ reaching nearly up to the fronto-orbital ones...1. *larvarum*, L.
- 8(7)(10) Frontal stripe equal in width to the sides of the frontalia, and the facial setæ at some distance from the fronto-orbital ones...  
2. *noctuarum*, Rnd.
- 9 (6) Face generally white.
- 10(7)(8) Frontal stripe wider than the sides of the frontalia, and the facial setæ reaching quite up to the fronto-orbital ones ..... 3. *latifrons*, Rnd.
- 11 (4) Scutellum black or grey.
- 12 (13) Middle abdominal segments with discal setæ .....4. *rustica*, Fln.
- 13 (12) Middle abdominal segments without discal setæ ..... 5. *erucarum*, Rnd.
- 14 (3) Wings without, or with a very slight, appendix.
- 15 Thorax blue-black and glistening, with white reflections...  
6. *angelicæ*, Mgn.
- 16 (2) Palpi black.
- 17 (20) Abdominal segments marked with straight black and white transverse bands.
- 18 (19) The white abdominal bands very narrow ..... 7. *brevipennis*, Mgn.
- 19 (18) The black and white bands nearly equal in width ..... 8. *morosa*, Mgn.
- 20 (17) Abdomen tessellated with brown and black patches, which form irregular transverse bands .....9. *agilis*, Mgn.
- 21 The first posterior cell ending close to the tip of the wing, and nearly, or quite, closed ..... 10. *hortensis*, Mgn.
- 22 (1) Legs with the tibiæ rufous .....11. *tibialis*, Fln.

#### T. LARVARUM, L.

Sides of frontalia and face mostly luteous ; frontal stripe narrower than the sides of the frontalia ; fronto-orbital bristles extending quite half way down the face ; facial bristles\* reaching up to within a short distance of the former ; peristome armed on each side behind the vibrissæ with a row of bristles extending backwards ; palpi yellow ; antennæ black, with the second joint sometimes rufous at the end, and about two-thirds of the length of the third joint, which is often thickened ; thorax and abdomen clothed with grey pubescence, which is mostly luteous, the former is marked with four longitudinal black even stripes, and has four external dorso-central bristles behind the transverse groove ; the latter has the first segment black, and

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\* These are the oral bristles of Rondani and Schiner (" *Mundborsten* "), they are on the edges of the facialia.



the others tessellated with black and grey, so as to form irregular transverse bands, the middle segments are without discal setæ, and the second one has usually only two bristles on the margin; scutellum red or yellow; wings with a spurious appendix, the apical cross vein curved, and the outer cross vein sinuous.

This well known insect varies greatly in size,\* colour, and other characters, and has, therefore, been divided into a number of different species; several of these, as *T. fasciata*, Fln., *T. flavescens*, and *T. præpotens*, Mgn., are no doubt only varieties of *T. larvarum*, but Rondani has described some others, which show slight differences of structure, and may, therefore, be looked upon as distinct species; two of these I have found, and shall include in my list, briefly pointing out the characters by which they differ from the type of the group (*T. larvarum*).

#### T. NOCTUARUM, Rnd.

The only points of difference between this and the preceding seem to be that the size is usually rather smaller, the frontal stripe is as wide or wider (in the male) than the sides of the frontalia, instead of being narrower, and that the facial setæ do not extend so high up towards the fronto-orbital ones. I have four specimens of this fly, all of which were bred from *Odonestis potatoria*.

#### T. LATIFRONS, Rnd.

This species differs from *T. larvarum* by having the face and pubescence usually white and cinereous, instead of luteous; by the frontal stripe being wider than the sides of the frontalia, by the eyes in the male being rather more widely separated, and by the facial setæ extending higher up, reaching quite to the level of the end of the fronto-orbital ones, or even a little above them. I received a male of this species from Mr. Bignell, bred from *Zygæna filipendulæ*, and a female from Mr. Fitch, reared from *Liparis chrysorrhæa*.

#### T. RUSTICA, Fln.

This is very similar in general appearance and characters to *T. larvarum*, but differs by having the scutellum black. The face is luteous; the palpi are yellow; the frontal stripe is narrower than the sides of the frontalia; the fronto-orbital and facial bristles nearly meet; the antennæ have the second joint about one-third shorter than the third in the male, and almost as long in the female; the outer dorso-central thoracic bristles are three in number behind the transverse groove; the second abdominal segment has four setæ on the margin, and two on the disc, and the third segment has four bristles on the disc; in other points it resembles *T. larvarum*. Not common; I received one from Mr. Brunetti, and another from Mr. Coryndon Matthews.

#### T. ERUCARUM, Rnd.

This species is very similar to the last, and is probably a variety of the same. I have only seen one specimen, which I captured in Oxfordshire, it resembles *T. rustica* in the scutellum being black, and in having three outer dorso-central thoracic bristles; it differs, however, in having no discal setæ on the second abdominal segment, though four are present on the third; the facial setæ are also more distant

\* From 9—14 mm.



from the fronto-orbital ones; the arista is thickened for a longer distance, and in my specimen the cubital appendix on the wings is very long and distinct, being true, and not spurious. Rondani says that this species is very variable, and has been described by Macquart under several different names, as *T. angusta*, *T. angustifasciata*, *T. flavicaliptrata*, *T. cæler*, and *T. pusilla*.

#### T. ANGELICÆ, Mgn.

Forehead prominent, frontal stripe equal in width to the sides of the frontalia, picaceous or black, with grey reflections; fronto-orbital bristles extending half way down the face; facialia almost bare, there being only a few short setæ placed above the vibrissæ; face white, with black reflections; antennæ with the third joint about twice the length of the second in the male, and about one and a half times in the female; palpi rufous; thorax glabrous, blue-black, with white patches and reflections, marked with four narrow stripes, the middle pair of which are nearer to each other than to the lateral ones, and having four outer dorso-central setæ behind the transverse groove; scutellum blue-black; abdomen elliptical, the first ring black, the front halves of the other rings glistening bluish-white, and the hinder halves surrounded by a shining black band; there is also a narrow, black, dorsal, longitudinal stripe, and setæ both on the disc and edges of the segments; the ventral surface is shiny black; wings brownish, with straight apical and outer cross veins, and a small costal spine. Rare; in Mr. Dale's collection.

#### T. BREVIPENNIS, Mgn.

Head with forehead prominent, the eyes widely separated in the female, with the central stripe wider than the sides of the frontalia; face white, with black reflections; antennæ grey, with the third joint a little longer than the second; fronto-orbital bristles extending to the end of the second antennal joint, where they spread out into an irregular patch; facialia almost bare; palpi black;\* thorax blue-black, covered with grey pubescence, marked with four moderately wide stripes, and having four external dorso-central setæ behind the groove; scutellum black; abdomen convex, shiny black, with the first ring quite black, and the others encircled with a narrow white ring on their front margins, and having setæ both on the disc and edges; wings greyish, with straight cross veins, and a short and rather indistinct spurious cubital appendix.

I have only seen one female specimen of this rare species, which I captured near Buckingham in 1873.

#### T. MOROSA, Mgn.

Head with the eyes a good deal wider apart in the females than in the males, frontal stripe wider than the sides of the frontalia in the latter, and equal in width in the former, in which sex the sides are shining black; antennæ grey, with the third joint about twice the length of the second in the male, and rather shorter in the female; arista with the basal half strongly thickened; palpi black, with the tips pale in some specimens; fronto-orbital bristles reaching the middle of the face; facialia almost bare; thorax blue-black, with front and sides grey, and marked with four narrow black stripes; scutellum grey; abdomen shining blue-black, marked in

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\* The points are picaceous in my specimen.

a very similar manner to that of *T. brevipennis*, only the white bands are much wider; there are setæ both on the disc and edges of the segments; wings greyish, with both the apical and outer cross veins curved. The females of this species are not uncommon, but I have only seen one male, which is in Miss Decie's collection, this sex was not known to Meigen.

#### T. AGILIS, Mgn.

Head with the eyes rather near together in the male; facialia ciliated for about one-third of their length; antennæ with third joint from one and a half to twice the length of the second; arista thickened for only one-third of its length; palpi black; thorax brownish-black, with front and sides white, marked with four rather indistinct black stripes, and armed with three external centro-dorsal bristles behind the groove; abdomen setose, tessellated with brown and grey patches, which form rather indistinct transverse bands on the segments, which are armed with setæ on both the disc and edges; scutellum black; wings greyish, having the apical cross veins long, oblique, and straight, and the other cross veins sinuous.

Rare; I have not seen the female. Miss Decie has a specimen in her collection which I named *T. bibens*, Mgn.; I now think that *T. bibens* and *T. agilis* are the same species.

#### T. HORTENSIS, Mgn.

Head with face white; antennæ with third joint twice as long as second; fronto-orbital bristles only extending down one-third of length of face; facial bristles reaching half way up facialia; palpi black; thorax covered with pale grey pubescence, and marked on front margin with four black stripes; outer dorso-central bristles three behind the groove; scutellum black; abdomen blackish-grey, first segment unmarked, others with an even whitish band round the front margin of each, and with setæ both on the disc and edges; wings with apical cross vein straight, with a blunt angle at the base, and ending near the apex of the wing, first posterior cell nearly, or quite, closed. Rare; one female is in Miss Decie's collection: the male has not been described.

#### T. TIBIALIS, Fln.

Head with forehead rather prominent, frontal stripe wide and rufous, or piceous; fronto-orbital bristles only extending as far as the root of the second antennal joint; antennæ with the second joint two-thirds the length of the third; facial bristles few; vibrissæ numerous; palpi black; thorax ash-grey, with three stripes, central one wide, and sometimes divided by a fine line; outer dorso-central setæ three in number behind the groove; scutellum black; abdomen grey, with black reflections and tessellations, and a narrow black band on the hinder edge of each segment (except on the first, which is quite black); setæ on the disc and margins of the rings; sides of second and third segments slightly rufous in the male; wings yellowish, with apical cross vein nearly straight, and ending near the tip of the wing, outer cross vein sinuous; legs black, with the tibiæ red or yellow, fore tarsi of the males with long claws and hairs. Not uncommon; it has been bred by Mr. Billups from *Vanessa urticae*.

## 23.—BRACHYCOMA, Dsr.

*Gen. ch.*—Eyes bare, shorter than the sides of the head; antennæ with the second joint short, the third joint thickened, and from one-third longer to twice as long as the second; arista thickened at the base and pubescent; fronto-orbital bristles not extending much below the base of the antennæ; cheeks sometimes ciliated with rows of hairs; facialia almost bare;\* abdomen without discal setæ, and marked with sub-semilunar spots; legs with long claws, hairs, and large pulvilli on the fore tarsi of the males only.

This genus is closely allied to both *Tachina* and *Macronychia*. It differs from the former by the shortened second antennal joint, and by the shortness of the row of fronto-orbital bristles; from the latter it may be known by the third joint of the antennæ being wider instead of narrower than the second one, and by the general shape and markings on the abdomen.

- 1 (2) Arista very shortly pubescent and cheeks ciliated.....1. *devia*, Fln.  
2 (1) Arista with base subplumose and cheeks bare .....2. *smerinthi*, *sp. n.*

## B. DEVIA, Fln.

Forehead, face and epistome prominent; sides of frontalia and face glistening white with black reflections; antennæ with third joint between two and three times as long as the second; arista long, with the basal two-fifths thickened and slightly pubescent; vibrissæ long and numerous; cheeks with a partly double row of small ciliæ, which extend from a little below the termination of the fronto-orbital bristles quite to the bottom of the face; palpi filiform and piceous, with the apices sometimes pale; thorax blue-black, with three longitudinal black lines, the central one broad and often trifid; three external dorso-central bristles behind the transverse groove; abdomen blue-black, the first segment quite black, the others marked on their hinder edges with two large semilunar black spots; wings with apical and outer cross veins both curved, and having a short appendix; legs black. Not uncommon.

B. SMERINTHI, *sp. n.*

Female. Forehead and epistome slightly prominent; eyes widely separated; frontal stripe rather narrower than the sides of frontalia, which, together with face, are white with black reflections; fronto-orbital bristles in a double row, the outer one being very short, consisting only of three or four setæ, the inner row continued to slightly below the roots of the antennæ; antennæ short, brown, with the third joint wide and about one-third longer than the second; arista rather short, with the

\* There is a very good figure of the head of one of these flies in Messrs. Brauer and Bergenstamm's Monograph on the "*Muscaria schizometopa*," Taf. vii, fig. 173.

basal third thickened and hairy ; palpi long and clavate, with the bases piceous and apices yellow ; cheeks bare ; vibrissæ few in number ; facialia quite nude ; thorax grey, with three wide black stripes, the middle one trifid in front of the transverse groove, the lateral ones interrupted ; external dorso-central bristles four in number behind the groove ; scutellum grey, with a fugitive black central spot ; abdomen oblong-ovate, convex, grey, tessellated with black and white patches, which assume the form of irregular, black, semilunar spots on the margins of the segments when viewed from behind ; ventral surface dark brown, glistening with white reflections ; wings clear, with apical cross veins deeply curved, and outer ones slightly sinuous ; a short cubital appendix ; legs black, hind tibiæ thinly and irregularly armed with setæ. This species is rather anomalous, it might be placed in the genus *Macronychia*, but differs from the characters assigned to that genus in having the third joint of the antennæ much wider instead of narrower than the second, by the abdomen being convex instead of rather flattened, and by the claws and pulvilli being small instead of large. Herr von Ernst Girschner has described\* a *Macronychia flavipalpis* which somewhat resembles this species, but it has clouded veins to wings and very sinuous outer cross veins.

I do not know the male, the only specimen which I have seen was given me by Mr. Bridgman, and was bred from *Smerinthus populi* by Mr. F. Norgate.

#### 24.—MILTOGRAMMA, Mgn.

SPHIXAPATA, p. Rnd.

*Gen. ch.*—Head large, somewhat swollen and vesicular ; eyes nude ; vibrissæ very small ; antennæ short and narrow, inserted in a deep facial groove, third joint about twice the length of the second ; arista short, nude or subpubescent ; frontalia wide, with broad central stripe ; fronto-orbital bristles short and weak, extending to root of antennæ ; cheeks bare ; facialia thickened, swollen, and pubescent ; thorax and abdomen covered with fine hairs, but having few bristles. The species are parasitic upon *Hymenoptera*, and they chiefly inhabit the south of Europe.

1 (2) Vibrissæ all short and small, and abdominal setæ few and weak...

1. *punctata*, Mgn.

2 (1) Vibrissæ with two setæ longer than the others, and with abdominal bristles moderately developed.....*Sphixapata*, Rnd....2. *conica*, Fln.

#### M. PUNCTATA, Mgn.

Yellowish-grey ; face silvery-white, with rufous reflections ; frontal stripe reddish-yellow and very wide ; antennæ black-brown, with tips of second joint ferruginous ; palpi yellow ; vibrissæ very small ; thorax with four or five black stripes in front, and three behind, the transverse groove ; scutellum yellowish-brown ; abdomen with three black spots on the second, third, and fourth segments ; wings clear ; legs black, fore tarsi of the males with long claws and hairs. Not common. This species

\* Entomol. Nachrichten, October, 1881.

is figured and described by Curtis, in his *British Entomology*. He found it in the Isle of Arran, as well as in the south of England. It is also in the Rev. E. N. Blountfield's and Mr. Dale's collections.

### M. CONICA, Flin.

This small species (about 4 mm. long) is more slender in shape than the former, from which it also differs by having two moderate-sized vibrissæ, and narrower frontalia, as well as good-sized setæ on the edges of the abdominal segments. The colour is grey, the frontal stripe is yellow; the face white, with grey reflections; the antennæ brown, the palpi nigrescent, the arista slightly pubescent; the thorax is pale grey, indistinctly striped; the abdomen yellowish-grey, marked with three spots on the first, second, and third segments, the middle spots being often indistinct; the wings have the apical cross veins curved, with a cubital appendix, and the outer cross vein sinuous; the legs are black, with the fore tarsi of the males furnished with long claws and hairs. Very rare.

### 25.—TRIXA, Mgn.

*Gen. ch.*—Eyes nude, approximated in the male, and widely separated in the female; fronto-orbital bristles in a double row in both sexes, and only extending to the base of the antennæ; antennæ very short, the second and third joints nearly equal in length, the latter with rounded extremities; arista subpubescent; cheeks bare; faciaia ciliated on their lower halves; chin large and hairy; palpi large, and with the ends clavate in the females; abdomen with both marginal and discal setæ; wings with a short but true cubital appendix.

The species of this well-marked genus are difficult to determine, and several of those described by Meigen and others appear to be only varieties. The wing veins are usually more or less clouded with black, particularly the inner cross veins, but this character is very variable in different individuals of the same species; the legs are also always more or less ferruginous, but the femora are often nigrescent, especially upon their upper surfaces.

- |       |                                                             |                                |
|-------|-------------------------------------------------------------|--------------------------------|
| 1 (2) | Legs with femora nigrescent, and with wing veins clouded... | 1. <i>astroidea</i> , Dsv.     |
| 2 (1) | Legs wholly ferruginous, and wing veins unclouded.          |                                |
| 3 (4) | Scutellum nigrescent .....                                  | 2. <i>alpina</i> , Mgn.        |
| 4 (3) | Scutellum ferruginous .....                                 | 3. <i>scutellata</i> , Newman. |

### T. ÆSTROIDEA, Dsv.

*variegata* ?, Mgn.

*dorsalis* ?, Mgn.

Head: sides of frontalia black (very narrow in the male), with white reflections; face white, crossed by black crescentic patches; antennæ and palpi rufous, the latter clothed with white tomentum on the apices; thorax grey, marked by three broad



black bands, the central one being often bifid; scutellum black or grey; abdomen tessellated with black and white patches, more or less arranged into transverse bands, sides rufous in the male, ventral surface yellow in the male, and black in the female; wings with the veins more or less clouded, the thickened inner cross vein forming a dark spot; legs with tibiæ and tarsi ferruginous, and the femora nigrescent. Meigen states that the antennæ and palpi are nigrescent in his *T. variegata*, but I believe it is only a variety of the above species. *T. dorsalis*, of the same author, seems to be only another variety, in which the wing veins are almost unclouded. Not uncommon; has been bred by Mr. Billups from *Cheimatobia boreata*.

*T. ALPINA*, Mgn., ♂.

*cærulescens*, Mgn., ♀.

This species differs from the former by having the thorax less distinctly striped, the wing veins slightly, or not at all, clouded; the legs wholly ferruginous, with the exception of the last joints of the tarsi, which are black, as well as the upper surfaces of the fore femora occasionally in the male; the sides of the abdomen and venter are reddish-yellow in the male (as in *æstroidea*), but blue-black in the females. Not common; in Mr. Dale's and Miss Decie's collections.

*T. SCUTELLATA*, Newman.

I have introduced this species into my list upon the authority of the late Mr. E. Newman, by whom it was briefly described;\* I have not seen a specimen, and doubt whether it is a distinct species: the only characteristic feature is the ferruginous scutellum; and, as Macquart says, that this part is sometimes rufous at the apex in *T. cærulescens (alpina, ♀)*, I suspect it is only a variety of that species.

26.—*CLYTIA*, Desv.

*Gen. ch.*—Head large; eyes bare; forehead and face prominent; frontalia and cheeks wide in both sexes; frontal stripe narrow; fronto-orbital bristles only extending to a little below the root of antennæ; vibrissæ small, facialia almost bare; antennæ short, second joint small, third joint from half to twice as long again as the second; arista nude, with second joint a little prolonged; abdomen subglobose in the males, with setæ only on the margins of the segments; wings with the first posterior cell ending near the apex. The little flies belonging to this genus are of a yellowish-grey colour, with a more or less luteous abdomen.

- |                         |                                 |
|-------------------------|---------------------------------|
| 1 (2) Legs black.....   | 1. <i>continua</i> , Pnz.       |
| 2 (1) Legs yellow ..... | 2. <i>rotundiventris</i> , Flm. |

*C. CONTINUA*, Pnz.

Frontalia and face golden-yellow in the male, and yellowish-white in the female; frontal stripe brown, very narrow in the male, and about twice as wide in the female;

\* Ent. Mag., i, 507.



antennæ black, third joint ovate, and about half as long again as the second; thorax yellow-grey, with four narrow black stripes; scutellum grey; abdomen yellow, translucent, oblongo-rotund, with glittering white reflections in the males, and having the hinder segments somewhat nigrescent; wings yellow at the base, with the fourth longitudinal vein bent at an angle, and the outer cross vein sinuous; legs black. Very rare.

### C. ROTUNDIVENTRIS, Flin.

This species bears a general resemblance to the former, but differs by having the antennæ and legs (with the exception of the tarsi) yellow; the wings with the fourth longitudinal vein bent in a curve, and the outer cross vein straight; the abdomen of the male is also more globular, and sometimes marked with black spots; the scutellum is partly or wholly luteous; the antennæ have the third joint longer and narrower than in *C. continua*, and the first and second joints always yellow; the third is sometimes nigrescent, and fully twice as long as the second joint; in the female the abdomen is ovate and pointed, and with the dorsum and apex grisescent. Rare; in Mr. Dale's collection.

### 27.—MACRONYCHIA, Rnd.

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*Gen. ch.*—Eyes nude, somewhat widely separated in both sexes; fronto-orbital bristles reaching to the roots of the antennæ, and partly in a double row in the male as well as in the female; antennæ with the second joint rather thickened and setose, the third joint not much longer than the second; arista bare; cheeks wide, and clothed with fine scattered hairs; facialia bare; vibrissæ with two long decussating bristles, placed some way above the epistome; abdomen ovoid, and somewhat flattened in the male, and elongated with a projecting horny oviduct in the female; the first segment is nearly as long as the others, and there are no discal setæ; wings with the fourth longitudinal vein bent at a sharp angle, and with a cubital appendix; legs having large tarsal claws and pulvilli in both sexes.

### M. AGRESTIS, Flin.

Colour yellowish-grey; forehead prominent; frontal stripe black, rather wider than the sides of the frontalia, which, like the cheeks, are white with black reflections; antennæ black; arista thickened to nearly the middle; palpi black; thorax with three wide stripes, the middle of which is trifid, and the outer ones maculiform; the outer dorso-central bristles are three in number behind the transverse groove; scutellum yellow-brown with a reddish tinge; abdomen grey, with three reddish-brown triangular spots on each segment, the bases of the triangles being backwards; legs black. This species, which is very variable in size, is rare; Mr. Dale has one in his collection.

*T. cylindrica*, Flin., has been recorded as a British species; I have not seen a specimen, and, from Zetterstedt's description, I do not think it will belong to this genus.

## 28.—MYOBIA, DSV.

PYRROSIA, p. Rnd.

*Gen. ch.*—Eyes nude, frontalia somewhat narrowed in the male, and wide in the female: fronto-orbital bristles extending to about the middle of the second joint of the antennæ; cheeks bare; antennæ with second joint a little elongated, and the third at the most twice as long; arista pubescent, with the base thickened; facialia ciliated with a few hairs on their lower part; vibrissæ seated near the sides of the epistome close to the mouth; palpi long and thick; abdomen elliptical or conical, with the segments all of nearly equal lengths, the middle ones mostly without discal setæ; wings with the fourth longitudinal vein bent at a blunt angle or in a curve; tarsi with the claws and pulvilli mostly small in both sexes. The four known British species are all more or less lutescent in colour, and very similar to each other, so that it is very difficult to discriminate them. Zetterstedt, in fact, considers *M. longipes* and *M. pacifica*, Mgn., only as varieties of *M. inanis*, Fln. They all belong to Rondani's sub-genus *Pyrrosia*; the middle abdominal segments being without discal setæ, and those on the margin of the last segment being arranged in a single series.

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April, 1892.
- |       |                                                         |                             |
|-------|---------------------------------------------------------|-----------------------------|
| 1 (2) | Fore femora with a black stripe on the upper surface... | 1. <i>fenestrata</i> , Mgn. |
| 2 (1) | Fore femora entirely yellow.                            |                             |
| 3 (4) | Hind femora as long as the abdomen .....                | 2. <i>longipes</i> , Mgn.   |
| 4 (3) | Hind femora shorter than the abdomen.                   |                             |
| 5 (6) | Abdomen in great part yellow .....                      | 3. <i>inanis</i> , Fln.     |
| 6 (5) | Abdomen only yellow at the base .....                   | 4. <i>pacifica</i> , Mgn.   |

## M. FENESTRATA, Mgn.

Frontalia occupying about one-fourth of the width of the head in the male, and one-third in the female; frontal stripe narrower than the sides of the frontalia, and reddish-brown in colour; palpi yellow, sometimes with dark tips; antennæ with first and second joints testaceous, and the third black and twice the length of the second; thorax dark grey, with four rather narrow stripes, and with three outer dorso-central bristles behind the transverse groove; scutellum yellowish-grey; abdomen dark brown, with the sides of the first and second segments yellow and translucent, leaving a central dorsal dark stripe of moderate width, which widens as it goes backwards, spreading out and covering the whole of the third and fourth segments; anal segments in the male dark grey; no discal setæ on any of the segments, and the setæ round the lower margin of the fourth segment arranged in a single row; wings with the outer cross vein straight and upright, and placed about one-fifth nearer to the angle of the fourth longitudinal vein than to the inner cross vein; legs yellow, with the exception of the tarsi, which are black, and of the fore femora, which are more or less nigrescent upon their anterior surfaces. Very rare; I have only seen one British specimen, which is in Miss Prescott-Decie's collection.

## M. LONGIPES, Mgn.

I have not seen a specimen of this species, but it is recorded as British by Walker. It is described as having a very narrow frontal stripe; antennæ with the third joint not much longer than the second; thorax with indistinct stripes; abdomen with the dark dorsal stripe so narrow over the first abdominal ring that in the female the yellow sides coalesce and form a large oval patch; the legs are also longer than in the other species, the hind femora reaching to the end of the abdomen. Very rare.

## M. INANIS, Fln.

This (the most common, and the typical species) closely resembles *M. fenestrata*, it is, however, usually rather larger, and altogether paler in colour; the frontal stripe is as wide as the sides of the frontalia, instead of being narrower; the thoracic stripes are finer, the scutellum yellow instead of greyish-yellow, the stripe on the back of the abdominal segments is rather narrower, and the yellow patches on the sides extend on to the third segment; the anal segment in the male is rufous or yellow instead of grey, the outer cross vein is rather nearer to the angle of the fourth longitudinal, being placed at about one-third of the distance between that and the inner cross vein, instead of two-fifths; the fore femora also are quite yellow. Not uncommon.

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## M. PACIFICA, Mgn.

This species differs from all the former ones by having the abdomen entirely grey, with the exception of a small yellow patch on each side of the first segment; the third joint of the antennæ is longer, it being between two and three times the length of the second; the palpi are thicker at the ends; the scutellum is grey; and the wings have the fourth longitudinal veins bent more at an angle. Rare; I captured one near Ulverstone, in Lancashire, in 1889; it is also in Miss Prescott-Decie's collection.

## 33.—LESKIA, Dsv.

MYOBIA, p. Mgn. and Mcq.

PYRROSIA, p. Rnd.

I have introduced this genus out of its numerical position in my analytical table owing to its close affinity to the preceding one, from which it scarcely differs, except by having the third joint of the antennæ a little longer. Meigen and Macquart both place the only species which it contains in *Myobia*, and Rondani includes it in his genus *Pyrrrosia*. R. Desvoidy thus defines the genus: "Tous les caractères du Genre Myobie, le troisième article antennaire triple du deuxième qui est plus court, teintes jaune."\* Though the characters of the two genera are, therefore, almost identical, still the species referred to *Leskia* is peculiar, and differs in appearance (being wholly

\* Essai sur les Myodaires, p. 100.

yellow) as well as in habits from those in *Myobia*, the larvæ of the latter being parasitic upon *Hymenoptera* or *Coleoptera* (*Curculionidæ*), while those of the former are said to live in the bodies of the caterpillars of *Lepidoptera* (*Sesiæ*).

L. AUREA, Fln.

*flavescens*, Dsv.

Ochreous; head and face golden-yellow, with silvery glitter; frontal stripe narrow, and reddish-brown; antennæ dark yellow; palpi yellow, long and narrow in the male, and slightly thickened at the end in the female; thorax light brown, with golden-yellow pubescence, and very faintly striped; abdomen ochreous and translucent, the sides and hinder edges of the segments having silvery-white reflections; calyptra and halteres yellow; wings brownish-yellow; legs yellow, with brown tarsi. Very rare.

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April, 1892.

29.—RÆSELIA, Dsv.

*Gen. ch.*—Eyes nude, and distant in both sexes; fronto-orbital bristles in a double row in both males and females, and descending to the roots of the antennæ; facial setæ ascending half-way up the face; antennæ with first and second joints short, and the third five or six times as long as the second; arista bare; abdomen oblong and convex, with the rings of nearly equal lengths, and with both discal and marginal setæ; wings mostly without the apical cross vein, and having the outer cross vein placed in the middle between the little (inner) cross vein to the point of flexure of the fourth longitudinal one. The sexes are very difficult to discriminate.

R. PALLIPES, Fln.

*antiqua*, Mgn.

Cinereous; forehead slightly prominent, frontalia wide, with a broad black or piccous stripe; antennæ with the first and second joints rufous or testaceous, and the third black, with the apex pointed in front; palpi rufous; thorax with four narrow lines, the outer ones small and broken; scutellum yellow at the apex; abdomen grey and immaculate, with the sides slightly rufous and diaphanous; legs yellow, with black tarsi, fore femora sometimes nigrescent at the base. There is no doubt that Meigen's *R. antiqua* is only a variety of *T. pallipes*, Fln., in which the apical cross veins are deficient; therefore, Fallén's name, which has the priority, must be adopted. Fallén remarks at the end of his description of *T. pallipes*: "Var.  $\beta$  ♀ Monstrosa, nervo alarum quarto abbreviato;" this variety seems more common than the other, and I cannot make out that it is a sexual peculiarity, as Fallén's remark would lead one to suppose. This fly is not uncommon; Mr. Brunetti sent me two captured at the same time at Dulwich, in one of which the apical cross veins are present, and in the other absent; I have one or two specimens captured by myself, in which a small portion of this vein remains, while the rest is deficient.

## 30.—MEIGENIA, Dsr.

TACHINA, *p.* Mgn.MASICERA, *p.* Meq.

SPILOSIA, Rnd.

*Gen. ch.*—Eyes bare or pubescent, approximated in the males, and widely separated in the females; fronto-orbital bristles extending to about the apex of the second joint of the antennæ; facial setæ few; antennæ with the second joint somewhat elongated, and the third from two to four times as long as the second; arista bare, cheeks nude; vibrissæ placed at some distance above the upper margin of the mouth (epistome); abdomen conical, mostly spotted, and having both discal and marginal setæ; wings with the fourth longitudinal vein bent at an obtuse angle, and the outer cross vein placed rather nearer to the angle than to the inner cross vein.

1 (2) With two spots on the second abdominal segment ..... 1. *bisignata*, Wdm.

2 (1) With three spots on both the second and third abdominal segments....

2. *floralis*, Mgn.

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April, 1892

## B. BISIGNATA, Wdm.

Forehead and face prominent; frontal stripe black; antennæ grey, with the third joint three or four times the length of the second; palpi black in the male, sometimes pale in the female; thorax of the male black, with three stripes, the middle one broad and sometimes trifid; the female thorax is cinereous, and marked with four narrow stripes; three outer dorso-central bristles behind the transverse groove; abdomen grey, with two distinct, large, round spots on the second segment, in the male with a central dorsal black line, anal segments black and shining; in the female the abdomen is greyish-white, with the spots very indistinct, and placed more on the sides; scutellum black in male, cinereous in female; legs black. Not common; I captured both sexes near Maidstone, in Kent, in 1891.

## M. FLORALIS, Mgn. non Fln.\*

This little species (from 3 to 4 mm. in size) resembles the former in its general colour and markings on the thorax, but the design upon the abdomen is different, there being three spots instead of two on the second segment, and also upon the third; they often coalesce, and the middle spots seem formed by a dilatation of part of the central stripe opposite the middle of the segments, the spot so formed being sometimes on a higher level than the others; the third joint of the antennæ is rather shorter in proportion than in *M. bisignata*, and the abdominal spots are much more distinct in the female. Rare; I captured a single male near York in 1889.

## 31.—MASICERA, Meq.

BLEPHARIPA, *p.* Rnd.CEROMASIA, *p.* Rnd.

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May, 1892

*Gen. ch.*—Eyes nude, widely separated in both sexes, but rather nearer together in the male than female; fronto-orbital bristles extending about as low as the root of the arista; facial setæ mostly few in number; antennæ with the second joint usually short, and with the third three or four times as long; vibrissæ with the large bristles placed near to the epistome; abdomen often wide and ovoid, as in the

\* *T. floralis*, Fln., belongs to the genus *Nemorilla*.



*Muscidæ*, and either with or without discal setæ; wings with the fourth longitudinal vein angularly bent, and without cubital appendix; legs with the hind tibiæ either evenly or irregularly ciliated on their outer sides.

This genus is closely allied to *Tachina*; the genera chiefly differ by the comparative lengths of the second and third joints of the antennæ, in *Tachina* the second being longer, and the third shorter, than those in *Masicera*. The wings also mostly have a cubital appendix in *Tachina*, and not in *Masicera*; and, lastly, the abdomen is usually wider and more oval in the latter than in the former genus.

- 1 (4) Hind tibiæ with an even row of short bristles on their outer sides (*Blepharipa*, Rnd.).
- 2 (3) Palpi yellow .....1. *major*, Mcq.
- 3 (2) Palpi black .....2. *atropivora*, Dsv.
- 4 (1) Hind tibiæ armed with bristles of unequal lengths.
- 5 (8) Middle abdominal segments without discal setæ (*Masicera*, Rnd.).
- 6 (7) Arista thickened for four-fifths of its length .....3. *sylvatica*, Fln.
- 7 (6) Arista only thickened for about one-third of its length...  
4. *pratensis*, Mgn.
- 8 (5) Middle abdominal segments with both discal and marginal setæ (*Ceromasia*, Rnd.).
- 9 (16) Tibiæ black.
- 10 (13) Arista thickened nearly to the end.
- 11 (12) Thoracic stripes of unequal widths, and apical cross veins curved...  
5. *myoidæa*, Dsv.
- 12 (11) Thoracic stripes of equal widths, and apical cross veins straight...  
6. *juvenilis*, Rnd.
- 13 (10) Arista only thickened along the basal third.
- 14 (15) Abdomen grey and immaculate .....7. *egens*, Egg.
- 15 (14) Abdomen spotted .....8. *parva*, Mcq.
- 16 (9) Tibiæ yellow .....9. *rutila*, Mgn.

### M. MAJOR, Mcq.

Rusty-black; frontalia of male occupying about one-fourth of the width of the head; frontal stripe reddish-brown, rather wider than sides of frontalia; face yellowish-white, with dark reflections; facial setæ extending nearly half way up the fascialia; antennæ with the first and second joints ferruginous, the third blackish-grey, and three times as long as the second; arista tapering gradually, thickened for about half its length; palpi yellow; thorax with four narrow and rather indistinct stripes, and four outer dorso-central bristles behind the groove; scutellum testaceous, and rather translucent; abdomen wide and oval, red on the sides in the male; tessellated with black and white patches, and having narrow white rings on the front margins of the second and third segments; discal setæ wanting; wings yellowish-grey, apical cross veins curved, outer cross ones placed obliquely, and nearly straight; legs black, hind tibiæ ciliated along their outer sides with an even thick row of rather short bristles. This fine species is in Mr. Dale's collection; it was taken at Bristol.



### M. ATROPIVORA, Dsv.

Head short and wide, with forehead and face flat; frontal stripe brown; sides of frontalia with face white, with blue-black reflections; antennæ black, with third joint about three times the length of the second; palpi black; arista thickened for two-thirds of its length; facialia almost bare; thorax black, with much white pubescence on sides and front margin, marked with four broad stripes, and having four outer dorso-central bristles behind the groove; scutellum testaceous, with base dark; abdomen whitish-grey, with the hinder edges of the segments and a dorsal band black; the sides are rufous in the male; no discal setæ; wings with fourth longitudinal vein bent at a right angle, the rest of the apical cross vein straight, outer cross vein straight; legs with hind tibiæ ciliated with short and strong setæ of even lengths. This well marked species is parasitic upon *Sphinx Atropos*, a large number of flies often emerging from a single caterpillar. In 1879, I received several specimens from Mr. Bignell which he had bred; I hoped at the time that the larva had been found in England, but Mr. Bignell told me afterwards that he received them from the Mediterranean. The species is common in Italy and the south of France.

### M. SYLVATICA, Flh.

Black, with grey pubescence; eyes wide apart; fronto-orbital bristles in a double row (posteriorly) in both sexes; frontal stripe brown, about equal in width to the sides of frontalia; antennæ with the third joint four times as long as the second in the male, but rather shorter in the female; arista thickened for about four-fifths of its length; palpi black with red ends, and a little clavate; facialia almost bare; thorax marked in front with four black stripes, which soon become confluent; outer dorso-central bristles three in number behind the groove; scutellum testaceous at the end; abdomen tessellated with black and white; middle segments without discal setæ; fourth segment very spinose, and having the apex clubbed or thickened in the male; wings with from four to six bristles at the base of the third vein; apical cross vein nearly straight; legs black, with the hind tibiæ unevenly ciliated. This large fine species, the males of which resemble those of *Sarcophaga carnaria* in shape, is not common; it has been bred by Mr. Billups from *Saturnia carpinii* and *Pieris brassicæ*.

### M. PRATENSIS, Mgn.

This species closely resembles the former in colour and design, but is smaller; it has the antennæ with the second joint rather longer, but the third shorter than in *M. sylvatica*, the latter being scarcely three times as long as the former; the arista is not thickened for quite half its length, and is a little pubescent; the frontal stripe is rather wider than the sides of the frontalia; the wings have only one or two small setæ at the base of the third vein, and the apical cross vein is a little more curved than in *M. sylvatica*; in all other points they are very similar. Rare.

### M. MYOIDÆA, Dsv. and Mcq. *senilis*, Rnd. et Mgn.?

Female black, covered with hoary pubescence; facial angle oblique; eyes widely separated; frontal stripe piceous, rather wider than sides of frontalia; an-

tennæ with third joint about three times the length of second, which is somewhat elongated; arista thickened almost to the end, and rather short; facial setæ extending fully one-third of the way up the face, which is white, with dark reflections; palpi black; thorax marked with four stripes, the middle pair being narrow, and the outer ones wide and irregular in shape; outer dorso-central bristles four behind the groove; scutellum grey; abdomen hoary, with a narrow black (often indistinct) dorsal stripe, and wide irregular black bands on the hinder parts of the segments; discal and apical setæ both present; wings with one small bristle at the base of the third vein, and with the apical cross vein a little curved; legs black. I do not know the male, but Rondani says the sexes are difficult to discriminate. Not common. I have named this species *myoidæa*, after Desvoidy and Macquart, though Rondani considers it to be the *M. senilis*, of Meigen. It corresponds closely to the description of *M. myoidæa* given by Macquart;\* therefore, Desvoidy's name has the priority; besides which, Meigen, in his account of *M. senilis*, states that the arista is only thickened at the base (Wurzel) instead of nearly to the end, and Rondani makes the thickened arista the characteristic feature of the species.

#### M. JUVENILIS, Rnd.

Male, shining black, with some grey pubescence on front and sides of thorax; face very oblique, eyes widely separated; fronto-orbital bristles in a single row, frontal stripe piccons, rather wider than sides of the frontalia, which are of a bluish-grey colour; the face is white, with black reflections, the lower part, with peristome, being rufous; facial setæ wanting; antennæ with the third joint fully four times the length of second, which is short; arista short, thickened almost to the end; palpi black; thorax with four stripes of nearly equal widths; outer dorso-central bristles four behind the groove; scutellum black; abdomen bright black, conical, with narrow white bands on the front margins of the segments, which have discal as well as apical setæ; wings with a single bristle at base of third vein, and apical cross vein nearly straight; legs black. The female is covered with hoary pubescence, has the abdomen oval, with irregular broad black and white bands, but it is in other points like the male. I captured a male of this rare species near Bicester (Oxon.) in June, 1880, and found a female in the late F. Walker's collection.

#### M. EGENS, Egger.

Black, uniformly covered with hoary pubescence; frontalia wide, middle stripe piccons, narrower than the sides, which are whitish-grey; face white and oblique; antennæ light grey, with third joint narrow, rather pointed, and about four times as long as the second; arista long and capillar, thickened for about one-fourth of its length; facialia with only a few setæ at the base; palpi piccons or black; peristoma rufescent; thorax with four slender black stripes, and four outer dorso-central post-sutural bristles; scutellum grey; abdomen conical, uniformly grey and immaculate, unless detrited; segments with discal setæ; wings tinged with yellow; apical cross veins straight, outer cross ones sinuous; legs black. Rare.

#### M. PARVA, Mcq.

Pale grey; face oblique, eyes wide apart; frontal stripe ferruginous, narrower

\* Ann. Ent. de France, s. 11, vol. viii, p. 468.

than sides of frontalia, which, with the face, are pale grey; fronto-orbital bristles only reaching to the second joint of the antennæ; facialia bare; antennæ with the third joint narrow, and about four times the length of the second; arista long and slender, with the basal third thickened; palpi black; thorax with four indistinct stripes, the central pair very narrow, the outer ones maculiform; outer dorso-central post-sutural bristles three in number; scutellum grey; abdomen grey, with a narrow dorsal stripe on the second segment, and a rather indistinct brown triangular patch or spot on each side of the second and third segments, those on the latter being very small; both discal and marginal setæ present; wings with apical cross vein nearly straight, and the outer cross one curved; legs black. This very small species (3—4 min.) is rare.

### M. RUTILA, Mgn.

Yellow-grey; facial angle nearly straight; frontal stripe rufous or picous, rather narrower than the sides of frontalia, which, with the face, are yellowish-white; antennæ brown, with third joint four times as long as the second, which, with the first, is ferruginous; arista thickened to rather beyond the middle; facialia with a few setæ at the bottom; palpi yellow; thorax with four narrow stripes, the outer pair being broken; post-sutural outer dorso-central bristles four in number; scutellum grey, with hinder part luteous; calyptæ ochreous; abdomen covered with yellow pubescence, and immaenlate, middle segments with both discal and apical setæ; wings tinged with yellow at the base and on the fore border; apical cross vein curved; legs black, with rufous or fulvous tibiæ, the hind ones armed on their outer sides with a number of rather short setæ of irregular lengths. This rare species was found by Miss Prescott-Decie at Westerton, by Elgin.

### 32—HYPOSTENA, Mgn.

[150]  
June, 1892.

*Gen. ch.*—Eyes nude, nearer together in males than females; facial angle nearly straight; fronto-orbital bristles extending to about the end of second antennal joint; facial bristles sometimes wanting, sometimes extending half way up the facialia; cheeks narrow and nude; antennæ with the second joint rather short, and the third fully four times as long; arista sometimes pubescent; abdomen oblongo-cylindrical, with or without discal setæ; wings with the fourth vein bent in a curve, and apical cross vein ending near the apex of the wing, outer cross vein placed midway between the inner cross vein and the bend of the fourth. The species are mostly small, black, and glabrous.

- 1 (2) Facialia bare, frontalia wide .....1. *procera*, Mgn.  
2 (1) Facialia ciliated, frontalia narrow.....2. *medorina*, Schnr.

### II. PROCERA, Mgn., Schnr.

*setiventris* ?, Mcq.

*incisuralis* ?, Mcq.

*cylindræa*, Ztt.

*chetigastrea* ?, Rnd.

Bright black; frontalia wide in both sexes, frontal stripe wide and black, sides

of frontalia with blue-black reflections; facial setæ few or none; palpi yellow or piceous; antennæ with third joint long and thick; arista bare, thickened to about the middle, where it becomes abruptly slender; thorax with the shoulders cinereous; three post-sutural dorso-central bristles; abdomen narrow, cylindrical, very long in the male, with discal setæ on the middle segments, which are very small and rather indistinct in the female, sides of the segments with silvery-white reflections, forming portions of interrupted transverse bands; wings brown in the male, nearly white in the female, apical and outer cross veins both nearly straight. Very rare.

## H. MEDORINA, Schnr.

Bright black; frontalia narrow, about one-sixth of the width of the head in the male; frontal stripe wide and piceous; face very narrow and white; facial setæ small, but extending half way up the facialia; antennæ with second joint a little elongated, the third slender, and about four times the length of the second; arista gradually thickened to about the middle, and slightly pubescent, with the second joint a little prolonged; palpi black; thorax with the shoulders snowy-white, and having a broken white line extending across the transverse suture; three post-sutural dorso-central bristles; abdomen brownish-black, with small patches of white reflections on the sides of the segments; middle rings with small discal as well as apical setæ; wings brunescent; legs black. I received a specimen of this rare species from Mr. Billups in August, 1890, which he had bred from *Pedisca sordidana*.

## 34.—METOPIA, Mgn.

*Gen. ch.*—Eyes nude, widely separated in both sexes; fronto-orbital bristles in a double row at the back, both in males and females, but only in a single row in front in the former; facial angle oblique; forehead prominent, and having more or less silvery glitter; facialia ciliated along the whole or a greater part of their length; antennæ with the second joint short, and the third fully six times as long; arista bare; abdomen without discal setæ, and mostly spotted; wings with fourth longitudinal vein bent at a sharp angle, and furnished with a cubital appendix.

1 (7) (8) Legs black.

2 (3) Forehead of male coated in front with silvery lacquer; sides of frontalia only, silvered in the female .....1. *leucocephala*, Rossi.

3 (2) Frontalia of ordinary form in both sexes.

4 (5) (6) Abdomen with sharply defined triangular spots...2. *argyrocephala*, Mgn.

5 (4) (6) Abdomen with semilunar or subtriangular spots .....3. *campestris*, Fln.

6 (4) (5) Abdomen with nearly straight transverse bands.....4. *amabilis*, Mgn.

7 (1) (8) Legs with pale tarsi .....5. *rubritarsis*, Ztt.

8 (1) (7) Legs with red femora .....6. *forficulæ*, Newport.

## M. LEUCOCEPHALA, Rossi.

♂. Forehead very prominent, glazed over the whole of its front portion with silvery lacquer, which extends to the roots of the antennæ, forming a kind of plate,

which is usually divided in the middle by a fine, black, longitudinal line; the frontal space behind is wide, and of a dull black colour, having an indistinct broad central stripe; the fronto-orbital bristles are in a double row behind, and are interrupted by the silvery plate emerging in a single row in front of it; face glistening white, with black reflections; cheeks with a few soft hairs on their upper part; facialia ciliated with strong bristles nearly to the top; palpi black; antennæ black or grey; arista thickened to a little beyond the middle; thorax dark grey, with four black stripes and three post-sutural outer dorso-central bristles; abdomen with white or yellowish reflections, and marked on each of the last three segments with three sub-triangular black spots; wings with several (5 to 8) small setæ along the base of the third vein, apical cross vein much curved; legs black.

♀. Forehead less prominent than in the male, and without the glistening plate; frontal stripe black, extending to the base of the antennæ, and wider than the sides of the frontalia, which are silvered on their front parts with white glitter; it is similar in other points to the male. Not rare.

#### M. ARGYROCEPHALA, Mgn.

Both sexes of this species bear a very strong resemblance to the female of *M. leucocephala*, and have often been confounded with it; they differ, however, by being usually rather smaller, by having the frontal stripe (which extends to the base of the antennæ in both sexes) narrower, it not being wider than the sides of the frontalia; by the facial setæ being less; by the thorax being of a lighter grey and more distinctly striped; by the abdomen also being more cinereous, and marked by more clearly defined triangular spots; lastly, the arista is not thickened quite so far. The males and females are very much alike, but can be distinguished by the difference in the fronto-orbital bristles, those of the male being only in a double row at the back part. Rare. It is in Mr. Dale's collection, and I captured a single specimen in Kent in 1888. [152] June, 1892.

#### M. CAMPESTRIS, Fln.

Frontal stripe much wider than the sides of frontalia; forehead slightly prominent; sides with face silvery-white, with dark reflections; cheeks without any hairs; arista with only basal third thickened (Meigen and Schiner say half); thorax with four moderately wide dorsal stripes, and three post-sutural outer dorso-central bristles; abdomen with silvery-white reflections, a central row of subtriangular spots and transverse sinuous bands, forming semilunar or irregular triangular spots on the sides of the segments; the male is usually more distinctly marked than the female, and has the fronto-orbital bristles only double at the hinder part; in other points this species resembles the former ones. Not common.

#### M. AMABILIS, Mgn.

This closely resembles *M. campestris*; the chief points of difference are that the forehead is a little more prominent, the arista is only thickened for a short distance at the base, and the longitudinal and transverse bands on the abdomen are nearly straight instead of being maculiform. Very rare.



*M. RUBRITARSIS*, Ztt.*flavitarrella*, Ztt.*Masicera rufitarsis*?, Mgn.

Forehead slightly prominent; face oblique; eyes rather nearer together in the male than in the female; frontal stripe much wider than the sides of the frontalia; black behind with grey reflections and red in front; sides of frontalia, like face, silvery-white, with grey reflections; fronto-orbital setæ small and far apart, extending to base of antennæ only, they are in a double row behind in the male; vibrissæ small; facial setæ minute, and extending up two-thirds of the face; palpi black with rufous ends; antennæ black or grey, third joint fully six times as long as the second; arista short and thickened for three-fourths of its length, then abruptly ending in a fine short bristle; thorax dark grey on the dorsum, with the shoulders and sides silvery-white, the white part extending a little across the transverse groove; in some lights two central black stripes are visible in the male, in the central part is shiny black; post-sutural outer dorso-central bristles three in number; abdomen subcylindrical, with thick apex in the male, ovoid and rather flattened in the female, grey with black bands, which form three irregular subtriangular spots on each segment in the male, but coalesce on the dorsum in the female, leaving it uniformly black, with only the spurs of three whitish bands on the sides; the segments are all smooth, without either discal or apical setæ, except on the end of the fourth; wings with the apical cross vein curved with a short appendix, outer cross vein straight; legs black, with the exception of the tarsi, which are testaceous or rufous, and also the knees and inner sides of the fore tibiae in the male. This little species (only 4—5 mm. in length) seems very rare. I captured a single specimen of both male and female near Bicester, Oxon, in July, 1883.

[153]  
June, 1892.

There is very little doubt but that this is the same as the *M. rufitarsis* of Meigen, but the facial setæ are so small that he must have overlooked them, and, therefore, placed the species in the genus *Masicera*. In all the principal characters it is a *Metopia*, but very feebly ciliated.

*M. FORFICULÆ*, Newport.\*

Mr. George Newport discovered a Tachinid which infests the common earwig. He gives an interesting account of its life-history during its larval and pupal states†, tracing it up to the development of the imago, which he says appears to belong to the genus *Metopia* of Meigen. His description of the fly (which I give below) is so vague and short however, that I do not think it is rightly placed in this genus and it is doubtful whether any specimens are preserved.

“*Metopia forficulæ*, cinerea, oculis testaceis, antennis nigris, corpore pedibusque pilis longis nigris vestitis; thoracis pilis lineas 6 lineas longitudinales efformantibus, scutello alarum basi femoribusque ferrugineis.

“*Muscâ domesticâ* aliquanto minor; *forficulas* prope Londinum infestat.”

\* Schiner, by mistake, refers this species to Mr. E. Newman, and Mr. Verrall does the same in his list.

† Proc. Linn. Soc., vol. ii, pp. 247—8, June 7th, 1853.



## 35.—FRONTINA, Mgn.

*Gen. ch.*—Head large, somewhat swollen and vesicular; eyes nude; frontalia wide and of nearly the same width in both sexes; facialia ciliated with strong bristles fully half way up; antennæ long, the second joint short, but the third mostly six times longer; arista bare; abdomen ovoid, with or without discal setæ on the middle rings; wings without cubital appendix, having the fourth vein bent at an angle, and the first posterior cell a little open, terminating near the apex of the wing.

- 1 (2) Abdomen yellow .....1. *lata*, Wdm.  
 2 (1) Abdomen black .. .....2. *nigricans*, Egg.

F. *LATA*, Wdm.

*T. lætabilis*, Ztt.

Frontalia of nearly equal widths in both sexes, central stripe rufous, of about the same width as the sides, which are of a golden-yellow colour; face oblique, whitish-yellow; cheeks bare; facialia strongly but not thickly ciliated nearly to the top; fronto-orbital bristles partly double in both sexes, extending a little below the root of the arista, rather lower in the male than the female; antennæ with the first, second, and basal half of the third joints yellow, the lower part of the third joint (which is six or seven times longer than the second) being grey; arista thickened rather beyond the middle; palpi yellow; thorax and scutellum covered with golden-yellow pubescence, the former marked by two narrow central stripes, and having two little, detached, narrow, oblong spots on each side; the post-sutural outer dorso-central bristles four in number; abdomen yellow and translucent with white reflections, and having a rather indistinct black dorsal band, more marked and wider in the male than female; the third segment has the posterior margin black; both discal and marginal setæ are present; wings yellow, first posterior cell partly open; legs grey, with upper surfaces of the femora and tarsi black, and tibiæ ferruginous; [178] July, 1892  
 the legs are paler in the female than in the male. Very rare.

F. *NIGRICANS*, Egg.

Black and glabrous; frontal stripe picous, about as wide as the sides of the frontalia, which are rough and vesicular, of a grey colour, with black reflections; fronto-orbital setæ large, and reaching to the end of the second antennal joint; cheeks white, with dark reflections, and ciliated with a row of small hairs, which extend half way down the face; facial setæ long and strong, extending more than half way up the face; vibrissæ large; antennæ grey, with the third joint thick, and from five to six times longer than the second; arista thickened to the middle; palpi black; thorax black and shining, the front margin, with the shoulders and sides being clothed with white pubescence, it is marked by four longitudinal black stripes, the middle pair being narrow, and the outer ones wide; there are four post-sutural outer dorso-central bristles; scutellum black, with the apex sometimes rufous;

metathorax light grey; abdomen black, glabrous, and spinose, with setæ both on the disc and margin of the segments, and having a band of white reflections on the front margins of the last three rings, which is complete on the second ring, but only marked on the sides of the others; legs black. Very rare; I have only seen one example, which I captured at Windermere, in June, 1884.

Schiner refers the *Fabricia pacta*, of Meigen, to this genus, and states that *Frontina austera*, of the same author, is only the female of the same species. I have a continental specimen of *F. austera*, which possesses the characters peculiar to the genus *Frontina*, but those described by Meigen and Walker as belonging to *F. pacta* are so different (the frontalia of the male being narrow, and the antennæ shortened), that I think the two flies cannot be referred to the same genus, or belong to the same species.

### 37.—BAUMHAUERIA, Mgn.

*Gen. ch.*—Head large; eyes small and nude; frontalia very wide, and with the face somewhat swollen; cheeks sometimes hairy; antennæ long, the third joint being fully six times as long as the second; facialia ciliated; wings with the first posterior cell closed at the apex, or, a little, before it.

This genus bears such a close affinity to the former, that I have placed them in juxtaposition, out of their proper order in my list; their characters are so much alike that it is difficult to know in which to place certain species, thus, *F. læta* is sometimes called a *Baumhaueria*, and *B. marmorata* a *Frontina*: the typical species of the former genus is *B. goniæformis*, Mgn., in which the first posterior cell is quite closed, and has a short stalk, it has not, however, been found in Britain.

#### B. MARMORATA, F.

##### *T. vertiginosa*, Mgn.

[179] Frontal stripe rufous or fuscous, much narrower than the sides of the frontalia, which are very wide, swollen, white, with grey reflections, and armed with fronto-orbital bristles in a triple row; cheeks large, glistening white, and bare; antennæ very long, with the first and second joints rufous, and the third grey, and nearly eight times as long as the second; arista thickened nearly to the end; palpi yellow; facialia ciliated for two-thirds of the way up; thorax greyish-white, marked with four stripes (the outer pair being maculiform), and with numerous little black spots, upon which the bristles are seated; post-sutural outer dorso-central setæ three in number; scutellum grey, with the apex mostly rufous; abdomen white, tessellated with numerous black spots and patches; and having setæ both on the disc and edges of the segments; wings with the apical cross veins curved, and having the first posterior cell closed at the apex, or, sometimes, slightly open; legs grey. I have adopted the Fabrician name, as it has the priority, and is very characteristic. Not uncommon; I have several specimens bred from *Arctia Carya*.

35A.—DESVOIDIA, *g. n.*

*Gen. ch.*—Eyes nude and small; forehead projecting, facial angle very oblique; frontalia wide, occupying nearly half the head in the female; cheeks and chin large, former bare; fronto-orbital bristles extending to root of arista; antennæ long, with second joint short, and third fully six times as long as second; arista short, bare, and thickened nearly to the end; abdomen with both discal and marginal setæ; wings with fourth vein bent at an angle, and without appendix; first posterior cell ending some way before the apex, and outer transverse vein in the centre between the inner cross vein and the angle of the fourth.

This genus is closely allied to *Metopia*, but has the following distinctions: the facial setæ only extend half way up the face; the abdomen has discal setæ; the wings are without cubital appendices, and the outer cross vein is placed centrally between the inner vein and the angle of the fourth.

D. FUSCA, *sp. n.**Metopia biserialis*, Mcq. ?.

Frontal stripe broad, wider than sides, piceous in front but pale behind; sides dull grey; fronto-orbital bristles numerous, in a double and partly treble row; face yellowish-white, with dark reflections; third joint of the antennæ stout; arista shorter than the antennæ, thickened and slightly increasing in thickness nearly to the end, where it narrows suddenly, and terminates in a short fine point; palpi black; thorax covered with yellowish-brown tomentum, and marked with four rather indistinct stripes; there are three outer dorso-central bristles behind the transverse suture, and two in front of it; scutellum brownish-grey; alulets large, white, and with a yellow border; wings a little nebulous, having the fourth vein bent at an angle, the apical cross vein a little curved, and the outer cross vein straight and oblique; abdomen brownish-black and shining, with a cinereous band round the front margins of the second and third segments, the former being quite straight and narrow, the latter one widening in the centre, so as to cover the middle of the dorsum of the segment; there are two marginal setæ in the centre of the first segment, two near the margin of the second, as well as two on the middle of the disc; there are two again on the disc of the third segment, as well as several on the sides, with two in the middle of the posterior margin; legs black, and very spinose, with the outer sides of the hind tibiæ irregularly ciliated. [180]  
July, 1892.

Length, about 5 mm.

This species, by its characters, closely resembles those given by Macquart of his *Metopia biserialis*; it differs, however, by the position of the outer cross vein, which, in *M. biserialis*, is said to be one-third nearer to the bend of the fourth vein than to the inner cross one. It is also nearly allied to the *M. convexinervis* of the same author, which is likewise an aberrant species of *Metopia*.

A female of this little fly was found by Mr. C. W. Dale, at Glanvilles Wootton, Dorset, on April 6th, 1892.

## 35B.—DEGEERIA, Mgn.

*Gen. ch.* —Eyes nude; forehead slightly prominent; facial angle a little oblique; frontalia narrow in the male, but moderately wide in the female; fronto-orbital bristles extending to about the root of the arista; facial setæ ascending half or more than half way up the facialia; antennæ with the third joint from three to six times longer than the second; arista sometimes pubescent; cheeks bare; abdomen usually with both discal and marginal setæ; wings with fourth vein mostly bent in a curve, and outer cross vein placed midway between the inner one and the bend of the fourth; first posterior cell ending near the tip of the wing.

- 1 (8) Palpi black.  
 2 (3) Thorax glistening white, in front of the transverse suture...1. *collaris*, Flh.  
 3 (2) Thorax with the shoulders, or front margin only, white.  
 4 (5)(6) Thorax marked with two black lines .....2. *blanda*, Flh.  
 5 (4)(6) Thorax unstriped .....3. *pulchella*, Mgn.  
 6 (5)(4) Thorax with four distinct stripes .....4. *grandicornis*, Zett.  
 7 (6) Thorax with four short and almost confluent stripes .....5. *pygmæa*, Meq.  
 8 (1) Palpi pale.....6. *muscaria*, Flh.

## D. COLLARIS, Flh.

*ornata*, Mgn.

Frontal stripe black, rather wider than sides of frontalia, which, like the cheeks, are glistening white, with dark reflections; antennæ grey; arista long, slender, slightly pubescent, and thickened along its basal third; facialia ciliated most of the way up; palpi black; thorax shining black, clothed in front as far as the transverse suture with snow-white pubescence, and marked on the anterior margin with four short black lines, which are often partly confluent; in the female the hinder half has a grey shine or reflection; there are three post-sutural outer dorso-central setæ; scutellum black; halteres yellow; abdomen oblongo-conical, bright black, with interrupted white fasciæ on the sides and front margins of the rings, which have also both discal and marginal setæ; wings with apical cross vein nearly straight and curved at the bend, outer cross vein straight, fifth vein sometimes abruptly shortened a little before reaching the margin of the wing, when the specimen has been looked upon as a distinct species from *D. ornata*, Mgn., in which the vein extends for its full length; legs black. Not common; in the Rev. E. N. Bloomfield's, Mr. Dale's, and Mr. Billups's collections.

## D. BLANDA, Flh.

Eyes rather widely separated, frontal stripe black or brown, rather narrower than the sides of frontalia, which are white with black reflections; face and cheeks silvery-white; antennæ long, third joint nearly six times as long as the second;

arista thickened to about the middle; facialia ciliated about half way up; palpi black; thorax shining black, with three glistening white stripes, the middle one shortened, thus leaving two black bands; post-sutural outer dorso-central setæ three in number; abdomen shining black, with a narrow white continuous band on the front margin of the second, third, and fourth segments, which have both discal and marginal setæ; wings with apical cross vein straight and curved at the base; legs black, with the fore tarsal joints dilated in the female. This well marked species, which varies a good deal in size, is rare; I have only seen one British specimen, which I captured at Windermere in June, 1884.

#### D. PULCHELLA, Mgn.

##### *minima*, Mcq.?

Sides of frontalia glistening black in the female; eyes of male approximated; face glistening white; antennæ with third joint three to four times as long as the second; arista thickened nearly to the middle; palpi black; thorax shining black, unstriped, with shoulders a little grey; abdomen bright black, elongated and narrow in the male, with slight white reflections on the sides, and a very slender pale grey band round the front edges of the second, third, and fourth segments, which have both discal and marginal setæ; wings and scales brown in the male; the former with the apical cross vein rather oblique, straight, and curved at the base; legs black.

*D. minima*, Mcq., is described as having the arista only thickened along its basal third, instead of to about half its length, and also as being much smaller than *D. pulchella*, otherwise they are very similar; the question of size is of no importance, it is so variable in many of the *Tachinidæ*, so I believe they are only varieties of the same species. Rare; both forms are in Mr. Dale's collection, and were captured at Glanvilles Wootton.

#### D. GRANDICORNIS, Zett.

Frontalia wide in the female, middle stripe piecous, and wider than the sides; antennæ with third joint long and thick; arista thickened to beyond the middle; palpi black; thorax shining black, with white reflections in front, and marked by four black stripes; abdomen conical, black, and glabrous, with a narrow white band round the front margin of the second, third, and fourth segments; wings with the fourth vein bent at an angle, outer cross vein sinuous, and fifth vein not quite reaching the margin of the wing. This rare species is in the Rev. E. N. Bloomfield's collection. Only the female is known, which closely resembles that of *D. collaris*, but differs by having the fourth vein bent at an angle instead of a curve, by the outer cross vein being sinuous, and by the white fasciæ on the abdomen being narrower.

[182]  
July, 1892.

#### D. PYGMÆA, Mcq.

Frontalia narrow in the male; central stripe piecous, and rather wider than sides; cheeks white, with dark reflections; antennæ with third joint between three and four times longer than second; arista with basal third thickened; facialia ciliated rather more than half way up; palpi black; thorax black, grey in front, where it is marked with four short stripes, almost confluent; post-sutural outer dorso-central bristles three in number; abdomen dull grey, with an undulating



black mark on the second and third segments, forming three sub-triangular confluent spots; discal and marginal setæ both present; wings and scales rather nebulous, the former with apical cross vein straight, and bent at the base in an obtuse angle; legs black, hind tibiæ thickly, but not quite evenly, ciliated on their outer sides. Rare; in Mr. Dale's collection; captured at Glanvilles Wootton. Only the male is known.

### D. MUSCARIA, Fln.

Frontal stripe black, equal in width to the sides of the frontalia, which are white, with dark reflections; antennæ with third joint only about three times the length of the second; arista thickened nearly to the middle; palpi yellow or testaceous; facial setæ not extending higher than the middle of the face; thorax cinereous, with four black stripes, which are often partly confluent; post-sutural outer dorso-central bristles three in number; wings with apical cross vein nearly straight, and bent at the base in a curve; legs black. Rare; in Mr. Dale's collection, found at Glanvilles Wootton, and I have a specimen in my own, which was given me by the Rev. E. N. Bloomfield, captured at Guestling, Hastings.

[210]  
Aug., 1892.

### 36.—PHOROCERA, Dsv.

*Gen. ch.*—Eyes hairy; facial angle rather oblique; frontalia wide in both sexes, but rather narrower in the male than female; facialia ciliated to above the middle of the face; antennæ long, with third joint from four to eight times the length of the second; arista generally long; abdomen mostly with both marginal and discal setæ; wings with the first posterior cell ending at some distance before the point of the wing, and outer cross vein placed nearer to the bend of the fourth vein than to the little cross vein.

- |    |      |                                   |                             |
|----|------|-----------------------------------|-----------------------------|
| 1  | (8)  | Palpi yellow or testaceous.       |                             |
| 2  | (3)  | Fourth vein bent in a curve ..... | 1. <i>concinata</i> , Mgr.  |
| 3  | (2)  | Fourth vein bent at an angle.     |                             |
| 4  | (5)  | Palpi very small.....             | 2. <i>filipalpis</i> , Rnd. |
| 5  | (4)  | Palpi of ordinary form.           |                             |
| 6  | (7)  | Scutellum black .....             | 3. <i>casifrons</i> , Mcq.  |
| 7  | (6)  | Scutellum rufous .....            | 4. <i>assimilis</i> , Fln.  |
| 8  | (1)  | Palpi black.                      |                             |
| 9  | (10) | Fourth vein bent in a curve ..... | 5. <i>unicolor</i> , Fln.   |
| 10 | (9)  | Fourth vein bent at an angle..... | 6. <i>cilipeda</i> , Rnd.   |

### P. CONCINNATA, Mgn.

*Machæra serriventris*, Rnd.

Frontalia with central stripe piceous, and rather narrower than the sides, which are yellowish-white, with dark reflections; cheeks nude, and with face luteous; facial setæ extending more than half way up; palpi filiform, yellow; antennæ grey, with third joint from four to six times longer than second; arista very long and capillary, thickened for about two-fifths of its length; thorax covered with grey pubescence, and marked with four stripes, the outer ones wider than the inner ones;



post-sutural dorso-central bristles four in number; scutellum grey; abdomen dull grey, first segment black, the others with black reflections, black hind margins to segments, a narrow dorsal stripe, and both discal and marginal setæ; the female has the ventral margins of the segments pressed together, so as to form a projecting and ciliated keel beneath the body, towards the end of which there is a curved, pointed, horn-like process, extending forwards; wings with the fourth vein bent in a curve, and first posterior cell terminating near the apex; legs black, hind tibiæ irregularly ciliated on outer sides. Not common; it has been bred by Mr. S. Saunders from *Abraxas grossulariata*, by Mr. Billups from *Vanessa urtica*, and by Mr. Bignell from *Acronycta tridens*.

#### P. FILIPALPIS, Rnd.

The characters of this species, according to Rondani, are very variable, so I shall describe them as they occur in the single example which I possess. The point [211] which at once distinguishes this species from all the others is the diminutive state Aug., 1892. of the palpi, which are pale yellow in colour, and very short and small; the forehead is slightly prominent, the frontal stripe piecous, and rather narrower than the sides of the frontalia, which are grey with a rufous tinge; fronto-orbital bristles extending to below the root of the arista; cheeks white and bare; antennæ with third joint thick, and fully six times the length of the second; arista with basal third thickened; facialia armed with strong cilæ for two-thirds of the way up; thorax cinereous, with four even black stripes; scutellum grey; abdomen cinereous, with posterior margins of segments black; setæ on both disc and margins; wings with apical cross vein straight, and ending near apex, fourth vein bent in a blunt angle, outer cross vein a little sinuous, and placed rather nearer to the angle of the fourth than to the little cross vein; legs black; length of specimen about 6 mm. Very rare.

#### P. CÆSIFRONS, Mcq.

##### *Chetogena assimilis*, Rnd.

Forehead prominent, frontal stripe black, and wider than sides of frontalia, which are slate coloured; cheeks white, with grey reflections, and ciliated with a few fine hairs; antennæ with first joint partly rufous, the second and third grey, the latter about four times the length of the former; arista long, with basal third thickened, and rest extremely slender; palpi yellow, grey and thin at the base, and sub-clavate at the end; facialia ciliated for about two-thirds of the way up; thorax covered with dark grey pubescence, and marked with four black stripes of about equal widths, which become indistinct on the hinder portion; outer dorso-central bristles, three in front and three behind the suture; scutellum dark grey, sometimes a little rufous at the tip; abdomen cylindrico-conical, with black and white tessellations, and armed with both discal and marginal setæ; anal segments of male incurved, and sometimes partly rufous; wings with apical cross veins deeply curved; legs black, hind tarsi ciliated beneath with yellow hairs. Not uncommon. This species varies very much in size.

#### P. ASSIMILIS, Flin. et Schnr.

##### *Chetogena grandis*, Rnd.

Fallén included this, together with the former species, under the name *assimilis*,

stating that the scutellum was either ferruginous or black ; but the presence of other points besides this show that he mixed two distinct species together ; I shall, therefore, follow Macquart and Schiner, naming the one with the black scutellum *P. cæsifrons*, and the other *P. assimilis*.

This species is usually more robust than *P. cæsifrons*, the forehead is very prominent, the frontal stripe rufescent, the frontalia are wider than in *cæsifrons*, the arista is thickened nearly to the middle, and has the extremity a little pubescent ; the apical cross veins are more oblique and less curved than in *cæsifrons*, the anal segments of the male are less incurved, the scutellum is almost entirely rufous ; all the other characters are similar to those of the former species. Rare.

### P. UNICOLOR, Fln.

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Aug., 1892.

Shining black, almost immaculate ; frontal stripe dull brown, rather wider than sides of frontalia, which are blue-black and glabrous ; antennæ black, with third joint robust, and five or six times longer than second ; arista thickened to the middle ; facial setæ extending only half way up the facialia ; palpi black, large, and clavate at the ends ; thorax black, with whitish-grey shoulders, four indistinct stripes, and three post-sutural outer dorso-central setæ ; abdomen black, with slight cinereous reflections, and setæ both on the disc and margins of the segments ; wings with fourth vein bent in a curve, and apical cross vein straight ; legs black, hind tibiæ ciliated on outer side with short but even bristles. Rare ; I have only seen one specimen, which was sent to me from Norfolk by Mr. Bridgman.

### P. CILIPEDA, Rnd.

*pavida*, Mgn. ?.

*pumicata*, Zett. et Meq. ?, non Mgn.

Blue-black, with hoary pubescence ; eyes long ; chin short ; frontal stripe rufous or black, about equal in width to sides of frontalia, which are grey with bluish reflections ; checks bare, pale grey with dark reflections ; facial setæ large, and rather far apart, extending fully two-thirds of the way up the face ; antennæ with the third joint four or five times as long as the second ; arista thickened to a little beyond the centre, and having a fine capillary extremity ; palpi black ; thorax hoary, with four very fine black stripes, and having four post-sutural outer dorso-central bristles ; scutellum with black base and red margin ; abdomen oval, blue-black, with hoary bands round the front parts of the segments, sides of the second segment red in the male ; both discal and marginal setæ ; wings with apical cross vein a little curved, and outer cross vein sinuous ; legs black, posterior tibiæ piceous or testaceous, and hind tibiæ ciliated along their outer surfaces with an even row of bristles, together with one long seta near the middle. Generally distributed.

*P. pumicata*, Mgn., is recorded as British, but I have not seen an example ; all the specimens so named that I have examined have been similar to those of *cilipeda*, having the hind tibiæ more or less rufescent, and ciliated with a somewhat even row of bristles ; I am, therefore, inclined to believe that these two (so-called) species are only varieties of one. *P. frontosa*, Mgn., has also been recorded as British, but I have not been able to see a specimen.

The six following genera contain small shining black species, with closed and pedunculated first posterior wing cells, naked eyes, and facialia, and short antennæ, which are so much alike that it is difficult to find any good diagnostic characters, and to place them in satisfactory groups; I shall, therefore, arrange them in another short analytical table before describing them.\*

- 1 (10) Alulæ small, or of moderate size.
- 2 (8) Outer cross vein placed nearly in the centre between the inner cross vein and the bend of the fourth vein.
- 3 (4) (5) Cheeks (not *facialia*) ciliated with a row of fine setæ, continuous with the fronto-orbital bristles ..... CLISTA, Mgn.
- 4 (3) (5) Cheeks armed on their lower part with a row of strong bristles... RHINOPHORA, Mgn.
- 5 (3) (4) Cheeks bare, or having only a few scattered fine hairs.
- 6 (7) Chin large and setose ..... FORTISIA, Rnd.
- 7 (6) Chin small and smooth.
- 8 (2) (9) Outer cross vein much nearer to the inner one than to the bend of the fourth vein ..... PLESINA, Mgn.
- 9 (2) (8) Outer cross vein nearer to the bend of the fourth than to the inner cross vein ... .. PHYTO, Dsv.
- 10 (1) Alulæ very large, and anal segments of female armed with claspers or forceps ..... LEUCOSTOMA, Mgn.

### 38.—CLISTA, Mgn.

LEUCOSTOMA, *p.* Zett.

*Gen. ch.*—Eyes long and nude, extending over most of the side of the head, approximate in the male; chin small but setose; epistome prominent; vibrissæ large; fronto-orbital bristles in a double row behind in both sexes, and the inner row continuous with a line of fine setæ, which extends to the bottom of the narrow cheek; facialia bare; antennæ with the second joint nearly as long as the third; arista sub-pubescent; abdomen without discal setæ; stalk of the first posterior wing-cell about two-thirds of the length of the outer cross vein, which is placed nearly midway between the bend of the fourth vein and the inner cross one, or sometimes rather nearer to the former.

- 1 (2) Abdomen with white fasciæ .....1. *mærens*, Mgn.
- 2 (1) Abdomen immaculate .....2. *ænescens*, Zett.

### C. MÆRENS, Mgn.

Black and glabrous; frontalia shining black behind, and with a central black

\* This table differs in some points from that placed at the beginning of my paper.

stripe and white sides in front; palpi black; thorax with a grey patch on the shoulders, and with three post-sutural dorso-central setæ; abdomen with an interrupted white band on the front margins of the segments; alulæ dirty white; halteres yellow; wings with a costal spine, and nigrescent along the front border. Not common. In the Rev. E. N. Bloomfield's and Mr. Dale's collections.

### C. *ÆNESCENS*, Zett.

This species differs from the former (*mærens*) by being a little larger, more æneous in colour, with rather wider frontalia; by the buccal setæ being arranged in a less regular row; by the cheeks and chin being larger; by the abdomen being wider (less cylindrical), and quite of a glistening æneous black colour, and by the cell-stalk of the wings being a little shorter. Not very rare.

### 38A.—*FORTISIA*, Rnd.

*CLISTA*, p. Mgn., Meq., Schr.

*Gen. ch.*—In general characters similar to *Clista*. Eyes bare and short; chin large and very setose; cheeks bare; fronto-orbital setæ only extending to the apex of second antennal joint; abdominal segments with discal setæ; first posterior wing-cell with a short stalk, only about a fourth of the length of the outer cross vein.

### F. *FEDA*, Wdm.

Frontalia very narrow in the male, and moderately wide in the female, with a dull black stripe, and shining black sides; face dark grey with black reflections; arista very short, with a thickened base; thorax and abdomen black, glabrous, and immaculate; alulæ mostly brown; wings nigrescent, with outer cross vein oblique, and placed rather nearer to the bend of the fourth than to the little cross vein; palpi black. Rare; in the Rev. E. N. Bloomfield's and Mr. Dale's collections.

### 39.—*RHINOPHORA*, Mgn.

*Gen. ch.*—Eyes bare, frontalia moderately wide in both sexes; fronto-orbital bristles extending to about the level of the roots of the antennæ, which are short, with the second and third joints of nearly equal lengths; arista pubescent; cheeks armed on their lower halves with a short row of strong bristles, which are placed near, but not on, the facialia; chin setose; abdomen long, narrow, and subcylindrical, with the segments of nearly equal lengths; wings with a rather long cell-stalk, it being nearly of the same length as the outer cross vein, which is placed almost in the middle between the bend of the fourth and the inner cross vein.

### R. *ATRAMENTARIA*, Mgn.

Frontalia with a black stripe, rather wider than the sides, which are white with black reflections; cheeks glistening white with dark reflections, and ciliated on their upper part with a row of fine hairs, which are continuous with the strong bristles on their lower part; antennæ black; arista strongly pubescent; palpi black; thorax

shining black, with three broad black stripes separated in front by white spots; post-sutural outer dorso-central bristles three in number; abdomen black and glabrous, with sub-interrupted, rather narrow, grey fasciæ on the front margins of the segments, which have both discal and marginal setæ; legs black and setose; wings brown, darker along the front margins. Not common; I captured it in Kent in June, 1888.

41.\*—PLESINA, Mgn. et Schnr.

STEVENIA, Dsv. et Rnd.

LEUCOSTOMA, Zett. et Meq., p.

*Gen. ch.*—Species small, with black marked wings, in which the outer cross vein is placed much nearer to the inner one than to the bend of the fourth vein; eyes nude, approximate in the male, and moderately wide apart in the female; cheeks narrow, and, like the facialia, without ciliæ; antennæ small and short; arista slightly pubescent; wings with the first posterior cell with a stalk nearly as long as the outer cross vein.

#### P. MACULATA, Fln.

Frontalia with the sides black, and with metallic lustre, central stripe dull black or piceous; face glistening white, with dark reflections; antennæ very small and rufous; arista very short; palpi very small and pale; thorax shining black, with slightly grey shoulders, and with three post-sutural outer dorso-central bristles; abdomen black, glabrous, and immaculate, without discal setæ; alulæ white; halteres with a yellow stalk and dark head; wings with a large black patch on the upper and distal half, and with the cross veins and further half of fourth vein clouded with black; legs black or piceous. Rare; in Mr. Billups' collection.

43.—PHYTO, Dsv., Rnd., p. Schnr., p.

RHINOPHORA, Mgn., p.

PTYLOCERA, Meq., p.

SAVIA, Rnd., p.

*Gen. ch.*—Species rather larger than in the last genus, and more griseescent; they also differ by having much shorter wing-stalks (their length not being more, and sometimes less, than a fourth of that of the outer cross vein); and by the position of the outer cross vein, which is placed rather nearer to the bend of the fourth than to the little cross vein; the cheeks have a few scattered fine hairs, but no setæ; the eyes are rather widely separated in both sexes; the antennæ have the third joint a little longer than the second; and the abdomen is either with or without discal setæ.

1 (2) Abdomen marked with grey fasciæ . . . . . 1. *melanocephala*, Mgn.

2 (1) Abdomen without fasciæ . . . . . 2. *nigra*, Dsv.

\* I keep to the numbers that I originally gave to the genera, though I have arranged them in a new order.



## P. MELANOCEPHALA, Mgn.

Frontal stripe black, rather wider than the sides of frontalia, which are grey, with dark reflections; face white; antennæ grey; arista long and pubescent, with basal third thickened; palpi yellow; thorax grey, with three wide dorsal black stripes, and three post-sutural outer dorso-central bristles; scutellum grey; abdomen black, with the front part of the segments bordered by wide interrupted grey bands, last segment quite grey; middle segments with both marginal and discal setæ, the first and second somewhat translucent and rufous on their under-surfaces in the male; alulæ and halteres yellow; wings grey, with yellow roots, having the fourth vein bent at a sharp angle, and sometimes furnished with a short appendix; legs piceous or black. Rare; I have two specimens, which I found in the late F. Walker's collection.

## P. NIGRA, Dsv.

*P. leucocephala*, var. Rnd.

This species differs from the former by having the abdomen black, glabrous, and without grey bands; by the absence of discal setæ on the segments; by the wings being without stalks, the cell being closed at the costa; by the apical cross vein being more oblique, owing to the fourth vein being bent at a more obtuse angle; by the absence of cubital appendix; and by the outer cross vein, which is oblique and sinuous, being placed rather nearer to the bend of the fourth vein. Rare; I captured a single specimen in June, 1878, at Sandy, in Bedfordshire.

## 42.—LEUCOSTOMA, Mgn., p. Zett., p. et Schnr.

## PSALIDA, Rnd.

This, the last of the group of small genera with closed first posterior wing-cells and short antennæ, differs from all the rest by having unusually large alulæ, and the anal segments of the female armed with forceps or claspers. I have followed Schiner in confining it to the species having these characters, referring several others which were included in this genus by Meigen and Zetterstedt to that of *Clista* or *Phyto*.

*Gen. ch.*—Frontalia narrow in the male, but wide in the female; eyes nude; antennæ short, with the third joint a little longer than the second; cheeks narrow and bare; facialia nude; palpi slightly clavate; abdomen short, thick, and fusiform, or spindle-shaped, without discal setæ, and armed with forceps at the end in the female; wings with a rather long cell-stalk (about two-thirds of the length of the outer cross vein), and with the hinder transverse vein nearly centrally placed.

## L. SIMPLEX, Flh.

Frontal stripe black, and rather narrower than the sides of the frontalia, which are black behind and grey in front; face glistening white, with dark reflections;



antennæ black, with the third joint a little thickened; arista short, slightly pubescent, and thickened for nearly half its length; palpi piccous; thorax and abdomen black, glabrous, and immaculate; the former having a little grey pubescence on the shoulders and sides; alulæ pure white, the lower scale being very long; halteres black; wings clear, outer cross vein placed a little nearer to the bend of the fourth than to the little cross vein; legs black. Rare.

40.—SCOPOLIA, Dsv.

PHORICHETA, Rnd.

[259]  
Oct., 1892.

*Gen. ch.*—Species small, black, and glabrous, with oblong conical bodies; eyes bare; frontalia wide in both sexes; cheeks narrow, and armed with a long row of strong bristles, continuous above with the inner fronto-orbital setæ, which are in a double row in both sexes; facialia bare; chin large and setose; antennæ long, the third joint being from three to five times as long as the second; arista bare; abdomen mostly with both discal and marginal setæ; wings with the third longitudinal vein ciliated from the root to the little cross vein, or to a little beyond it; first posterior cell closed, and with a longer or shorter stalk, outer cross vein situated nearly midway between the inner cross vein and the bend of the fourth.

- |       |                                      |                            |
|-------|--------------------------------------|----------------------------|
| 1 (2) | Palpi black, and wing stalk short    | 1. <i>tricincta</i> , Rnd. |
| 2 (1) | Palpi pale, and wing stalk long.     |                            |
| 3 (4) | Antennæ narrow, and pale at the base | 2. <i>carbonaria</i> , Pz. |
| 4 (3) | Antennæ thick, and quite black       | 3. <i>lugens</i> , Mgn.    |

S. TRICINCTA, Rnd.

Frontal stripe subrufous; sides of frontalia and face grey, with dark reflections; antennæ black or grey, with third joint thick, and only about three times the length of the second; arista thickened nearly to the middle; palpi black; thorax black, rather æneous, marked in front with three short, wide, black stripes, and having some white pubescence on the shoulders and sides; post-sutural outer dorso-central bristles three in number; abdomen shining black, with a narrow white band on the front margins of the second, third and fourth segments, which are armed with both discal and marginal setæ; wings slightly tinged with brown, having the apical cross vein deeply incurved and joining the third near the costa, leaving a short stalk not more than a fourth or fifth of the length of the outer cross vein, which is slightly curved and placed a little nearer to the bend of the fourth than to the little cross vein; a short cubital appendix is sometimes present; third longitudinal vein ciliated as far as little cross vein; veins not nebulous.

This well marked species is not common. I captured it near Bradford in 1876, and again at Silverdale in Lancashire in 1881.

S CARBONARIA, Pz.

Characters of head and face as in the former species, with the exception of having the palpi yellow, and the antennæ rather longer, much narrower, with their bases testaceous; the thorax is also similar; the abdomen is entirely black and less setose; the wings are fuliginous, with the fore borders very dark, and the veins nebulous; the apical cross vein is much less curved than in *S. tricincta*, and the

stalk is much longer, being about two-thirds of the length of the outer cross vein ; there is also sometimes a short cubital appendix.

Not common. In Mr. Dale's and Miss Prescott-Decies' collections.

### S. LUGENS, Mgn.

Rather larger than the last species, with a long subcylindrical abdomen in the male ; frontalia with central stripe piceous and rather narrower than the sides, which are shining black, somewhat raised and tuberculated, having snowy-white reflections in certain lights ; face silvery-white and glittering, with dark reflections, and armed along its whole length with a row of strong setæ, continuous with the inner row of fronto-orbital bristles ; antennæ black and thick, with the third joint scarcely three times the length of the second ; arista thickened to about the middle, where it suddenly becomes thin ; palpi yellow ; thorax shining black and immaculate, with shoulders slightly grey ; abdomen black, very setose, and without discal setæ on the second segment ; alulæ large and white ; halteres with red stalks and white heads ; wings slightly nigrescent, especially along the front border, third longitudinal vein ciliated up to the little cross vein ; fourth vein bent at an obtuse angle, apical cross vein a little incurved, and meeting the third vein at some distance from the costa, so as to leave a stalk about three-fourths of the length of the outer cross vein, which is quite straight and centrally placed.

Rare. I have only seen a single male, which is in the Rev. E. N. Bloomfield's collection.

### 40A.—BRACHYCELIA, *n. g.*

SCOPOLIA, Schnr., *p.*

TACHINA, Zett., *p.*

*Gen. ch.*—Species small and black, with short ovoid bodies ; eyes bare ; frontalia wide in both sexes ; fronto-orbital bristles in a double row in both male and female, and extending as low as the apex of the second joint of the antennæ ; cheeks narrow and bare ; chin small ; facialia ciliated half or two-thirds of the way up ; antennæ long, with the third joint four or five times as long as the second ; arista bare ; thorax short and wide ; abdomen short, thick and oval, with both discal and marginal setæ ; wings with the third vein unarmed, with the exception of the ordinary two or three setæ at the root ; first posterior cell closed, and having a stalk of moderate length ; legs short.

I have separated this genus from *Scopolia*, from which it differs by the species being shorter and rounder in shape ; by having the facialia ciliated, and not the cheeks ; by the third longitudinal vein of the wings being without setæ ; and by the legs being shorter.

### B. OCYPTERINA, Zett.

Frontal stripe dull and piceous, rather wider than the sides of the frontalia, which, with the face, are cinereous with dark reflections ; antennæ grey, with the second joint lighter in colour than the third ; arista thickened to about the middle ; palpi piceous ; thorax shining black, with slight grey pubescence, and having four

rather indistinct black stripes, and three post-sutural outer dorsal central bristles; abdomen shining black and immaculate, alulae dull white with pale yellow borders; wings clear, with the stalk of the first posterior cell about half the length of the outer cross vein.

Not uncommon. I captured it in 1891 near Maidstone in Kent; I have also received it from the Rev. E. N. Bloomfield of Guestling, and it has been bred from *Pterophorus tephrodactylus* by Mr. Bignell and Mr. Butler of Hastings.

#### 44.—TRYPIERA, Mgn.

*Gen. ch.*—Eyes hairy, approximate in male, wide apart in the female; antennæ rather short, with the third joint about twice the length of the second; arista bare; facialia nude; wings with the first posterior cell closed, and with a short stalk at the end, and the outer cross vein almost centrally placed between the little cross vein and the bend of the fourth.

I introduced this genus into my table under the impression that one of its species, viz., the *T. umbrinervis* of Zetterstedt had been found in Britain, but upon careful examination I have determined that the specimens which I had so named, as well as others that I had received from Germany under the same title, are only examples of *Exorista dubia*. According to Zetterstedt, his *T. umbrinervis* differs from *E. dubia* by having the third joint of the antennæ linear, and only twice as long as the second, instead of being thickened and fully thrice as long; by the arista being only biarticulate, instead of triarticulate; and by the first posterior wing-cell being always quite closed, and terminating at the apex of the wing, while in *E. dubia* it is often slightly open and ending a little before the point of the wing.

#### 45.—LÖWIA, Egger.

MACQUARTIA, p. Rnd.

*Gen. ch.*—Species shining black; eyes hairy; frontalia straight, narrow in male and wide in female; antennæ short, with the third joint but little longer than the second; arista pubescent; facialia nude; abdomen rather wide and oval, with both discal and marginal setæ; wings with the first posterior cell closed and stalked at the end.

This genus closely resembles *Macquartia*, with which it was combined by Rondani; the only important distinction between them being the closed and stalked wing-cell.

#### L. BREVIFRONS, Rnd.

Shining black; abdomen with a greenish tinge; facialia with central stripe and sides black, the latter being elevated and glazed in the female; face grey; cheeks bare; antennæ black, with basal joints testaceous in the female; arista rather short, with the base thickened; wings brunescent, with the stalk to the first posterior cell short, it being about one-fourth of the length of the outer cross vein; alulae brown; legs black.

Rare. I captured both sexes near Bradford in 1877.

Bradford, Yorks.:

August, 1892.



R. H. Meade

1892.

*Aphria angustifrons.*





## Speciei novae Tachinidarum descriptio

a R. H. Meade in Bradford.

### Aphria angustifrons.

*Enlibra Z. Meade.*  
Mus. 1892.

♂ *Oblongo-subcylindrica, fusco-cinerea, thorace quadri-striato, abdomine nigro-fasciato lateribus rufescentibus, macrochaetis discoidalibus in dorso segmentorum intermediorum instructo. Frontalia angusta, ritta nigra. Antennae fuscae articulo tertio secundo parum longiore. Arista articulo penultimo subelongato. Palpi nigri, tenues, longiusculi, apice setosi. Proboscis picea, cornea, elongata angustaque. Alae spinula costali magna, vena tertia longitudinali basi parce setulosa. Pedes nigri. Long. 8mm. Patria: Britannia.*

♂ Head. Frons slightly prominent; frontalia narrow, central stripe black and wider than the sides which like the face are white, having blue-black reflexions. Eyes nude; fronto-orbital bristles in a single row on each side and extending down the face as far as the apex of the second joint of the antennae; checks bare and divided from the chin (mentum) by a transverse groove of a yellow-brown colour; chin ciliated with a few long bristles; epistome very prominent and testaceous in colour; vibrissae few in number having one long seta on each side; facialia with a few short ciliae at the bottom; antennae gray, the first joint very short, the second about twice as long as broad, the third about half as long again as the second, rather dilated, and rounded at the end; arista with the second joint distinct and a little prolonged, and the third rather long and slender, with the base dilated, and a little pubescent along its whole length; proboscis piceous, long, slender, horny, and narrowed towards the apex, where the suckers are very minute; palpi long, filiform, slender, with the points a little thickened, and furnished with several projecting long bristles. Thorax covered (more thickly on the front) with yellowish gray tomentum, and marked with four moderately wide black longitudinal stripes, which are interrupted at the transverse groove; behind the

groove are three external dorso-central bristles. Scutellum gray. Calyptra large and white. Halteres yellow. Abdomen conico-cylindrical, the first segment narrow and black. the second, third, and fourth segments, cinereous, with an irregular interrupted black band on the sides of the hinder margins of each segment; the under sides of the second and third segments are a little rufescent and translucent; there are large macrochetae both upon the margin and disk of the three last segments. Wings slightly brunescent, rather short, with a long costal spine, and with the fourth longitudinal vein curved at the angle; the apical cross vein is also a little bent outwards. the outer cross vein is rather sinuous, and the third longitudinal vein has two or three rather long bristles at the base. The first posterior cell is open at the end and terminates a little before the apex of the wing. Legs black, tarsi long, with large pulvilli and some long hairs at the end; hind tibiae with a few long bristles of unequal lengths on their outer sides.

A single male of this well marked species was found by Mr. Pascoe at Folkestone on the sea coast of Kent in England.

This insect is rather anomalous for it differs in two points from those given as characteristic of the Genus *Aphria*, firstly the frontalia in the male are narrow so that the eyes are approximated, while they are described as being nearly equally wide apart in both sexes; secondly the middle abdominal segments have discal setae instead of being unarmed in the middle. R. Desvoidy in his first diagnosis of *Aphria* does not mention either of these points, and Meigen in his description of *Tachina longirostris* in his 4<sup>th</sup> Vol. says nothing about the abdominal macrochetae; the later characters, given to the genus have evidently been taken from one or two species only, but if new ones occur possessing the chief points of structure but differing in one or two minor points. I think it is better to retain them in the same genus than to form a new one for their reception.



















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